This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of a 6.0 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Town of Culpeper WPCF 400 South Main St Culpeper, VA 22701	SIC Code :	4952 WWTP
	Facility Location:	15108 Service Lane Culpeper, VA 22701	County:	Culpeper
	Facility Contact Name:	James Hust	Telephone Number:	540-825-1199
	Facility E-mail Address:	JHust@culpeperva.gov		
2.	Permit No.:	VA0061590	Expiration Date of previous permit:	3/9/2015
	Other VPDES Permits associated with this facility:		VAR051441, VAN020024	
	Other Permits associated with this facility:		Air PSD#41019	
	E2/E3/E4 Status:	Not Applicable (NA)		
3.	Owner Name:	Town of Culpeper		
	Owner Contact/Title:	Chris Hively, Town Manager	Telephone Number:	540-829-8251
	Owner E-mail Address:	chively@culpeperva.gov		
4.	Application Complete Date:	August 21, 2014		
	Permit Drafted By:	Alison Thompson	Date Drafted:	5/13/2015
	Draft Permit Reviewed By:	Doug Frasier	Date Reviewed:	5/20/2015
	WPM Review By:	Bryant Thomas	Date Reviewed:	5/27/2015
	Public Comment Period :	Start Date: 7/20/2015	End Date:	8/19/2015

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name :	Mountain Run	Stream Code:	3-MTN
Drainage Area at Outfall:	12.3 sq.mi.	River Mile:	19.86
Stream Basin:	Rappahannock	Subbasin:	Rappahannock
Section:	4	Stream Class:	III
Special Standards:	None	Waterbody ID:	VAN-E09R
7Q10 Low Flow:	0.30 MGD*	7Q10 High Flow:	2.70 MGD
1Q10 Low Flow:	0.21 MGD*	1Q10 High Flow:	1.96 MGD
30Q10 Low Flow:	0.55 MGD*	30Q10 High Flow:	5.05 MGD
Harmonic Mean Flow:	2.85 MGD	30Q5 Flow:	0.80 MGD

*While the calculations show that there is some flow in Mountain Run during low flow conditions, no dilution will be allowed since the instream waste concentration is essentially 100% during low flows and the water quality of the stream will mirror the quality of the effluent.

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law		EPA Guidelines
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation	X	Other (9VAC25-40)
X	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class I

8. Reliability Class: Class I

9. Permit Characterization:

	Private		Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule Required
	State	X	Whole Effluent Toxicity Program Required		Interim Limits in Permit
X	POTW	X	Pretreatment Program Required		Interim Limits in Other Document
X	TMDL	X	e-DMR Participant		

10. Wastewater Sources and Treatment Description:

Wastewater from the collection system either flows via gravity or is pumped by force main to the larger of two influent pump stations. The larger influent pump station has 4 pumps (2 variable speed and 2 fixed speed) that can each pump 6 MGD. There is a smaller influent pump station (the McDevitt Pump Station) that pumps directly to the headworks building with 2 variable speed pumps which can pump a maximum of 4 MGD; the only flow contributions to this influent pump station are the Community College and the Library of Congress.

The headworks building contains two centerflow bar screens (one 6 MGD and one 12 MGD) and a vortex grit removal chamber. The flow is then split through 2 parshall flumes. The flow is then measured, and sent to the 2 primary clarifiers.

Wastewater leaving the headworks building flows to the two primary clarifiers and then to the two BNR tanks with diffused aeration, followed by two secondary clarifiers. Effluent from the primaries flows to the Equalization Pump Station that will allow flow the go to the BNR tanks or can pump portions of the flow to the 9 MGD equalization basin. Glycerin is added as a carbon source into the anoxic zones in the BNR tanks. Secondary clarifier effluent is pumped by the intermediate pump station to the equalization basin at the advanced waste treatment portion of the plant. Wastewater from the basin then flows through the flash mixer where it is mixed with Alum, and then into the 3 flocculation basins followed by tertiary clarifiers. There are 6 single media gravity filters; carbon source addition is also available at this point. Filter effluent is disinfected with UV disinfection as of August 5, 2009. The facility installed 3 UV channels each with 6 banks of 8 bulbs per bank. Flow is post-aerated and then metered before being discharged at Outfall 001 into Mountain Run.

The final effluent composite is collected after UV disinfection. The pH and DO samples are collected at the bottom of the step aeration.

The facility received a Certificate to Operate for the 4.0 MGD flow tier on June 12, 2008. The Certificate to Operate for the 6.0 MGD facility was issued on April 22, 2010 and a copy of the 6.0 MGD CTO is found in Attachment 2 with the facility schematic.

TABLE 1 – Outfall Description				
Outfall Number	**Discharge Sources**	**Treatment**	**Design Flow(s)**	**Outfall Latitude and Longitude**
001	Domestic and Commercial Wastewater	See Item 10 above.	6.0 MGD	**38° 27' 56"** N **77° 58' 08"** W
See Attachment 3 for (Culpeper East, DEQ #184B) topographic map.				

11. Sludge Treatment and Disposal Methods:

There are two sludge sources to two anaerobic digesters operated in series. Primary sludge from the primary clarifiers flows through a gravity thickener. Thickened sludge is pumped into the primary digester. Sludge from the secondary clarifiers flows to the gravity belt thickener where polymer is added and the sludge is thickened to 5% solids and pumped to the primary Digester. Sludge is withdrawn from the secondary digester and emulsion polymer is added and centrifuged. The dewatered sludge falls into truck and stored in 2 sheds until it can be land applied by a contract hauler on approved fields. Recyc Systems of Remington, Virginia, currently land applies the biosolids. Alternately, sludge may disposed in a permitted landfill.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2 – Discharges and DEQ Monitoring Stations	
VA0085723	Culpeper Petroleum Cooperative discharge to Mountain Run, UT.
3-MTN028.68	DEQ Ambient Water Quality Monitoring Station at the spillway of Mountain Run Lake, 8.82 miles upstream from the Town of Culpeper WPCF discharge.
3-MTN027.08	DEQ Ambient Water Quality Monitoring Station at the Route 641 Bridge on Mountain Run, 7.22 miles upstream from the Town of Culpeper WPCF discharge.
3-MTN025.17	DEQ Ambient Water Quality Monitoring Station at Lake Pelham (the Town's drinking water reservoir), 5.31 miles upstream from the Town of Culpeper WPCF discharge.
VAG840107	Luck Stone Culpeper Quarry discharge to Mountain Run and Potato Run, UT.
3-MTN003.31	DEQ Ambient Water Quality Monitoring Station at the Route 672 Bridge on Mountain Run, 16.55 miles downstream from the Town of Culpeper WPCF discharge.
3-MTN000.59	DEQ Ambient Water Quality Monitoring Station at the Route 620 Bridge on Mountain Run, 19.27 miles downstream from the Town of Culpeper WPCF discharge.

13. Material Storage:

TABLE 3 - Material Storage		
Materials Description	**Volume Stored**	**Spill/Stormwater Prevention Measures**
Alum	10,000 gallons	Indoors; Secondary containment
Glycerin	9,000 gallons	Outdoors in a heated storage tank
Diesel Fuel	15,300 gallons	Double-walled tanks
Polymer	750 gallons in totes	Stored inside; floor drain to pump station
Sodium Bicarbonate	Pallet of 50 lb bags	Stored inside

14. Site Inspection:

Performed by Lisa Janovsky, DEQ Water Compliance Inspector, on October 21, 2014 (Attachment 4).

Mountain Run at the point of discharge has a defined stream channel of approximately 25 feet wide with a depth of 6 -12 inches on the date of the inspection. The bottom is a mixture of smaller rocks, sand, and silt. In the warmer months, there is sometimes attached algal growth right in the vicinity of the discharge. Approximately 50 feet from the discharge, there was a shallow pool. No algal growth or sludge deposits were noted downstream of the discharge.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

This facility's outfall is located on Mountain Run. DEQ fish tissue/sediment station 3-MTN022.21 is located approximately 1.9 miles upstream from Outfall 001 and DEQ ambient monitoring station 3-MTN022.49 is located approximately 2.9 miles upstream from Outfall 001. The following is the water quality summary for this segment of Mountain Run, as taken from the 2012 Integrated Report:

DEQ monitoring stations located in this segment of Mountain Run:

- *fish tissue/sediment station 3-MTN022.21, at Fauquier Road*
- *ambient monitoring station 3-MTN022.49, at Route 522*

The recreation, fish consumption and wildlife uses are considered fully supporting. The aquatic life use is considered fully supporting. However, the consensus based probable effects concentration (PEC) sediment screening values for the following parameters were exceeded in sediment samples collected in 2006; total PAHs (22,800 ppb, dry weight), anthracene (845 ppb, dry weight), benz(a)anthracene (1,050 ppb, dry weight), phenanthrene (1,170 ppb, dry weight), chrysene (1,290 ppb, dry weight), naphthalene (561 ppb, dry weight), pyrene (1,520 ppb, dry weight), benzo(a)pyrene (1,450 ppb, dry weight), fluorene (536 ppb, dry weight), and fluoranthene (2,230 ppb, dry weight). These are all noted as observed effects for the aquatic life use. In addition, citizen monitoring finds a high probability of adverse conditions for biota. An observed effect will be noted.

The nearest downstream DEQ monitoring stations are located within a segment of Mountain Run that begins approximately 0.37 mile downstream from Outfall 001. DEQ freshwater probabilistic monitoring station 3-MTN018.83 is located approximately 1.3 miles downstream from Outfall 001 and DEQ ambient monitoring station 3-MTN014.88 is located approximately 5.5 miles downstream from Outfall 001. The following is the water quality summary for this segment of Mountain Run, as taken from the 2012 Integrated Report:

DEQ monitoring stations located in this segment of Mountain Run:

- *ambient monitoring station 3-MTN014.88, at Route 663 (Stevensburg Road)*
- *freshwater probabilistic monitoring station 3-MTN018.83, downstream from Route 15 / 29 Bypass*

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The aquatic life use is considered impaired, based on benthic macroinvertebrate survey results. An observed effect is noted for the aquatic life use based on one exceedance of the consensus based probable effects concentration (PEC) sediment screening values for chlordane (17.6 ppb, dry weight). The wildlife use is considered fully supporting. E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use.

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b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4 - Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report							
Mountain Run	Recreation	*E. coli*	0.37	Mountain Run 04/27/2001	4.58E+12 cfu/year *E. coli**	55 cfu/100 ml *E. coli* --- 6.0 MGD	---
	Aquatic Life	Benthic Macroinvertebrates		No	---	---	2020
	Fish Consumption	PCBs		No	---	---	2018

*The WLA of 4.58E+12 cfu/year includes the WLA that was previously assigned to permit VA0090212 Mountain Run WWTP, which has been terminated. Consistent with the Culpeper Nutrient Allocation Agreement, the WLA was derived by adding the WLA previously applied to this permit (3.23E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 6.0 MGD) to the WLA previously applied to the terminated permit (1.35E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 2.5 MGD).

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on December 29, 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.e provides additional information on specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

The planning statement is found in Attachment 5.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Mountain Run is located within Section 4 of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

The Freshwater Water Quality/Wasteload Allocation Analysis (Attachment 6) details other water quality criteria applicable to the receiving stream.

Some Water Quality Criteria are dependent on the temperature and pH and Total Hardness of the stream and final effluent. The stream and final effluent values used as part of Attachment 6 are as follows:

pH and Temperature for Ammonia Criteria:
The fresh water, aquatic life Water Quality Criteria for Ammonia are dependent on the instream temperature and pH. Since the effluent may have an impact on the instream values, the temperature and pH values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile temperature and pH values are used because they best represent the critical conditions of the receiving stream.

For the 2006 permit modification, DEQ staff used ambient data from Ambient Monitoring Station 3-MTN003.31 from July 2004 through Jun 2006 (Attachment 7) to establish the 90th percentile and 10th percentile pH values. This was done so that the criteria development was consistent with what was done in the Greens Corner WWTP and the Mountain Run WWTP. It should be noted that both of these permits have now been terminated.

Staff has reviewed the effluent data reported on the Discharge Monitoring Reports (DMRs) from January 2011 through March 2015 for pH and finds no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the previous permit. Therefore, the previously established pH values of 7.25 S.U. for the 90th percentile and 6.3 S.U. for the 10th percentile shall be carried forward as part of this reissuance process. The current effluent data can also be found in Attachment 7.

Historically, a default annual temperature value of 25°C and a default of 20°C for the wet season were used to calculate the ammonia water quality criteria. These values will be carried forward with this reissuance. The ammonia water quality standards calculations are shown in Attachment 6.

Total Hardness for Hardness-Dependent Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's total hardness (expressed as mg/L calcium carbonate) as well as the total hardness of the final effluent.

Staff used a value of 66.6 mg/L for the last reissuance; this value was derived from ambient monitoring data collected from July 2004 through July 2006. This value shall be carried forward for the receiving stream for this reissuance.

The facility has also monitored total hardness of the effluent on a once every four month frequency since receiving the Certificate to Operate for the 6.0 MGD flow tier. The average total hardness for the effluent is 78.4 mg/L. The effluent data can be found in Attachment 8.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[1]For a minimum of four weekly samples [taken during any calendar month].

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Mountain Run, is located within Section 4 of the Rappahannock River Basin. This section has been designated with no special standards.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on February 13, 2015, for records to determine if there are threatened or endangered species in the vicinity of the discharge. No threatened or endangered species were identified or confirmed in the database search.

The US Fish & Wildlife Service asked for coordination for this reissuance. They noted that the federally listed, endangered dwarf wedgemussel (*Alasmidonta heterodon)* is known to occur in the receiving stream, Mountain Run. Their response as well as the comments from the Virginia Department of Game and Inland Fisheries are found in Attachment 9. They noted a high Ammonia as N concentration value in the facility's application. See Fact Sheet Section 17.a for further discussion.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on the fact that the stream is dominated by effluent from the Town's discharge during low flow periods. The 7Q10 flow is 0.30 MGD where as the current permitted design flow for the WPCF 6.0 MGD. Additionally, Mountain Run is listed in the 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report as impaired for Benthic Macroinvertebrates just downstream of the outfall location. Also, the effluent limits for the Town's WPCF are designed to meet and maintain the Water Quality Standards.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are then calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening:
Effluent data obtained from the permit application and Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation. The following pollutants require a wasteload allocation analysis: Ammonia as N, Copper, Zinc, and Alpha-Endosulfan.

DMR effluent data were reviewed, and there were Ammonia as N exceedances in February and March 2013. In the winter months, the nitrifying bacteria population in the biological portion of the plant was adversely affected. In colder temperatures, the bacteria reproduction rate can slow enough to prevent complete nitrification. The facility worked with their engineer and determined that during the winter months, both BNR basins should remain online and the plant should maintain higher mixed liquor concentrations. A review of the data since then shows that the facility has had no repeat problems during the winters of 2014 or 2015 and maintained full compliance with the Ammonia as N limitations.

Copper, Zinc, and Alpha-Endosulfan were noted in the Form 2A scans during the last reissuance. Staff opted to obtain additional effluent data from the facility once the Certificate to Operate was obtained for the 6.0 MGD expansion. The data will be evaluated for the need for limitations during this reissuance. Summaries of the results reported on the DMRs are found in Attachment 10.

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b. Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{Co\,[\,Qe + (f)(Qs)\,] - [\,(Cs)(f)(Qs)\,]}{Qe}$$

Where:
- WLA = Wasteload allocation
- Co = In-stream water quality criteria
- Qe = Design flow
- Qs = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- Cs = Mean background concentration of parameter in the receiving stream.

Because the critical stream flows are very small in comparison to the flows from the WWTP, no dilution is used to derive the effluent limitations. As such, there is no mixing zone and the WLA is equal to the water quality criteria.

c. Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN:

At the 6.0 MGD design flow during the June through November time frame, the TKN monthly average limit of 3.0 mg/L ensures adequate protection of the ammonia criteria, and no ammonia limit is needed. The TKN limit of 3.0 mg/L for summer is based on modeling conducted in August and September 2006 and is adequate to protect the DO criteria as well (Attachment 11). The TKN weekly average limit will be 4.5 mg/L for summer is based on a multiplier of 1.5 times the monthly average.

However, ammonia limits are needed during winter (December through May) as the TKN limit of 8.0 mg/L from the dissolved oxygen modeling is not stringent enough to protect the ammonia criteria during the winter months. DEQ guidance suggests using a sole data point of 9.0 mg/L for discharges containing domestic sewage to ensure the evaluation adequately addresses the potential for ammonia to be present in the discharge. Staff proposes to carry forward the existing winter ammonia limits at the 6.0 MGD flow tier. As such, an ammonia monthly average limit of 3.7 mg/L and a weekly average limit of 4.5 mg/L are needed in winter (December – May) to protect the chronic water quality criteria (Attachment 12).

Also, the Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent in NPDES Discharge Permits. It is staff's best professional judgment that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms, so any minor changes in the Ammonia as N effluent limitations would be counterproductive to the new EPA ammonia criteria.

2) Metals

Evaluations during the last reissuance showed that limits were needed for Copper and Zinc, but the facility was undergoing an extensive upgrade and expansion, so in lieu of limits, the permittee monitored once every four months for dissolved copper, dissolved zinc, and total hardness after the CTO for the 6.0 MGD was issued.

An evaluation of the Copper data from the DMRs showed that no limit is necessary (Attachment 12). Monitoring for Copper will be removed with this reissuance since the final effluent demonstrated that there was no reasonable potential to exceed the Water Quality Standards.

An evaluation of the Zinc data from the DMRs showed that no limit is necessary (Attachment 12). Monitoring for Zinc will be removed with this reissuance since the final effluent demonstrated that there was no reasonable potential to exceed the Water Quality Standards.

3) Organics (Pesticides):

Alpha Endosulfan was detected in the effluent in the 2007 effluent sampling done as part of the application for reissuance. Evaluation showed that a limit was needed, but the facility was undergoing an extensive upgrade and expansion, so in lieu of a limit, staff had the permittee monitor the effluent once every four months after the CTO for the 6.0 MGD was issued. All reported results were less than detection, so an evaluation of the data showed that no limit is necessary (Attachment 12). Monitoring for Alpha Endosulfan will be removed with this reissuance since the final effluent demonstrated that there was no reasonable potential to exceed the Water Quality Standards.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), carbonaceous biochemical oxygen demand-5 day ($CBOD_5$), total suspended solids (TSS), Total Kjeldahl Nitrogen (TKN), and pH limitations are proposed.

Dissolved Oxygen, BOD_5, $CBOD_5$, and TKN limitations for the 6.0 MGD flow are based on stream modeling conducted in August and September 2006 (Attachment 11) and are set to meet the water quality criteria for Dissolved Oxygen (DO) in the receiving stream. The model is the agency's Regional Water Quality Model for Free Flowing Streams Version 4.11.

The model assumes that Mountain Run is at 7Q10 flows during winter and summer periods and that discharge flows are at their maximum. While this scenario is relatively unlikely, it is a reasonable worst case scenario that assures the effluent from the Town's WPCP will not cause a violation of the DO criteria (5.0 mg/L) even under extreme conditions.

The results of the model show that the stringent limits already in place for the summer months are sufficient to protect the DO criteria even with the expanded flow of 6.0 MGD. However, during winter, a BOD_5 concentration limit of 12 mg/L will be required in order to safely protect the DO criteria in winter.

It is staff's practice to equate the Total Suspended Solids limits with the BOD_5/$CBOD_5$ limits. TSS limits are established to equal BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170 and the TMDL for Mountain Run which was originally approved in 2001 and was modified in 2009. This facility was given a WLA of 3.23E+12 cfu/year of *E. coli* bacteria in the 2009 modified TMDL. With this reissuance, the facility will be given a WLA of 4.58E+12 cfu/year. This revised WLA includes the WLA that was previously assigned to permit VA0090212 Mountain Run WWTP, which has been terminated. Consistent with the Culpeper Nutrient Allocation Agreement, the WLA was derived by adding the WLA previously applied to this permit (3.23E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 6.0 MGD) to the WLA previously applied to the terminated permit (1.35E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 2.5 MGD). The permit incorporates the annual *E. coli* bacteria load from the TMDL; the load will be calculated on a rolling 12-month window to demonstrate compliance with the TMDL. The monthly geometric mean concentration is established at the water quality criterion of 126 cfu/100mL.

e. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients
VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. Only concentration limits are now found in the individual VPDES permit when the facility installs nutrient removal technology. The basis for the concentration limits is 9VAC25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* which requires new or expanding discharges with design flows of ≥0.04 MGD to treat for TN and TP to either BNR (Biological Nutrient Removal) levels (TN = 8 mg/L; TP = 1.0 mg/L) or SOA (State of the Art) levels (TN = 3.0 mg/L and TP = 0.3 mg/L).

This facility has also obtained coverage under 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN020024. Total Nitrogen Annual Loads and Total Phosphorus Annual Loads from this facility are found in 9VAC25-720 – *Water Quality Management Plan Regulation* which sets forth TN and TP maximum wasteload allocations for facilities designated as significant discharges, i.e., those with design flows of ≥0.5 MGD above the fall line and >0.1 MGD below the fall line.

The Town of Culpeper requested a permit modification in April 2011 in order to revise the Total Nitrogen and Total Phosphorus Annual Average limitations for the 6.0 MGD flow tier since there was an executed Nutrient Allocation Consolidation Agreement between the Culpeper Town Council and the Culpeper County Board of Supervisors. The DEQ Modification Memorandum as well as the Nutrient Allocation Consolidation Agreement are found in Attachments 13 and 14 respectively. Per the Nutrient Allocation Consolidation Agreement, the TN and TP allocations for the un-built Mountain Run WWTP were transferred to and consolidated with the Town of Culpeper's TN and TP allocation. Based on this consolidation, the 6.0 MGD facility shall have an annual average Total Nitrogen concentration of 4.0 mg/L and an annual average Total Phosphorus concentration of 0.30 mg/L.

Monitoring for Nitrates + Nitrites, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus are included in this permit. The monitoring is needed to protect the Water Quality Standards of the Chesapeake Bay. Monitoring frequencies are set at the frequencies set forth in 9VAC25-820. Annual average effluent limitations, as well as monthly and year to date calculations, for Total Nitrogen and Total Phosphorus are included in this individual permit. The annual averages are based on the technology installed as part of the WQIF grant funding.

f. Effluent Limitations and Monitoring Summary:

The effluent limitations are presented in the following table. Limits were established for Flow, BOD_5, CBOD5, Total Suspended Solids, Ammonia as N, Total Kjeldahl Nitrogen (TKN), Total Nitrogen, Total Phosphorus, pH, Dissolved Oxygen, and *E. coli.* Monitoring was included for Nitrates+Nitrites and Whole Effluent Toxicity (see Fact Sheet Sections 18 and 20.b. for further discussion).

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

The mass loading (lb/d) for TKN monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 8.345.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD_5/$CBOD_5$ and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

The backsliding proposed with this reissuance conforms to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, 9VAC25-31-220.L., and 40 § CFR 122.44.

Toxicity samples collected by the facility in June 1989 to December 1989 demonstrated chronic toxicity in the effluent. During this same time frame, the effluent had copper concentrations that routinely exceeded the Virginia chronic water quality criteria and the EPA acute water quality criteria. The facility was required to perform a Toxics Reduction Evaluation (TRE) by the State Water Control Board (now DEQ) and the TRE Plan was approved on March 6, 1992. Confirmation was completed and the Whole Effluent Toxicity limit of 1.04 TU_c at the 3.0 MGD flow tier became effective on September 6, 1995. The facility exceeded this WET limitation and a Special Consent Order dated November 1998 required another TRE. During the 1999 reissuance, new flow data was available for the receiving stream, so the WET limit was recalculated. The recalculated limits were 1.82 TU_c for the 3.0 MGD flow tier and 1.80 TU_c for the 4.5 MGD flow tier. During the 2010 permit reissuance, the WET limit was again recalculated and determined that a WET limit of 1.5 TU_c should be applied at Outfall 001.

On March 10, 2010, the permit was reissued with the WET limit of 1.5 TU_c for the current 4.0 MGD facility as well as for the expanded flow tier of 6.0 MGD. As part of their comments to the draft permit, the permittee asked that staff consider removing the WET limit once the facility received the CTO for the 6 MGD flow tier. In their comments they stated,

> "The antibacksliding rule, 9VAC25-31-220.L, allows for the adjustment of the WET provision at Part I.A.2. and Part I.D.1.a to "NL" (no limit, monitor and report) to apply upon issue of the CTO for the 6 MGD facility. More specifically, this request is appropriate under provision 9VAC25-31-220.L.2.a. of the antibacksliding rule, which applies in the case here of "material and substantial alterations or additions to the permitted facility."

It was staff's best professional judgment that the limit remain in the permit during the 2010-2015 permit term and during the next reissuance evaluate the results of the toxicity testing.

On April 22, 2010 the Certificate to Operate for the expanded 6.0 MGD facility was issued. The expansion included most of the unit processes so the majority of the facility was upgraded or replaced during this upgrade resulting in a substantially different facility once constructed. Once the new facility was online, the Town performed 8 quarterly WET tests. All tests passed and the facility was allowed to go to annual testing. Also during the permit term the facility monitored for copper and it was determined that there was no reasonable potential to exceed the copper criterion.

Based on the above information, it is staff's best professional judgment that the backsliding be allowed and the WET limit may be removed. The facility shall continue to monitor for WET on an annual basis in accordance with Guidance Memo No. 00-2012 – *Toxics Management Program Implementation Guidance* for the major wastewater treatment plants.

(The rest of this page is intentionally blank.)

19. Effluent Limitations/Monitoring Requirements – 6.0 MGD:
Design flow is 6.0 MGD.
Effective Dates: period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
BOD_5 (December – May)	3,5	12 mg/L 270 kg/d	18 mg/L 410 kg/d	NA	NA	1/D	24H-C
$CBOD_5$ (June - November)	3,5	8 mg/L 180 kg/d	12 mg/L 270 kg/d	NA	NA	1/D	24H-C
TSS (December – May)	2	12 mg/L 270 kg/d	18 mg/L 410 kg/d	NA	NA	1/D	24H-C
TSS (June – November)	2	8.0 mg/L 180 kg/d	12 mg/L 270 kg/d	NA	NA	1/D	24H-C
Ammonia, as N (December – May)	3	3.7 mg/L	4.5 mg/L	NA	NA	1/D	24H-C
TKN (June - November)	3, 5	3.0 mg/L 150 lb/d	4.5 mg/L 220 lb/d	NA	NA	1/D	24H-C
TKN (December – May)	3, 7	NL mg/L	NA	NA	NA	1/W	24H-C
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
Dissolved Oxygen	3, 5	NA	NA	6.5 mg/L	NA	1/D	Grab
E. coli (Geometric Mean)	3, 6	126 n/100 mL	NA	NA	NA	1/D	Grab
E. coli – Rolling 12 Month Max Load	6	NA	NA	NA	4.58E+12	1/M	Calculated
Nitrate+Nitrite, as N	3, 7	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [a.]	3, 7	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [b.]	3, 7	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year [b.]	3, 7	4.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	3	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [b.]	3, 7	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus - Calendar Year [b.]	3, 7	0.30 mg/L	NA	NA	NA	1/YR	Calculated
Whole Effluent Toxicity (*C. dubia*)	3	NA	NA	NA	NL	1/YR	24H-C
Whole Effluent Toxicity (*P. promelas*)	3	NA	NA	NA	NL	1/YR	24H-C

The basis for the limitations codes are:
1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 11
6. TMDL for Mountain Run
7. 9 VAC 25-40 (Nutrient Regulation)

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once per year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected. Where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by ≥10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

a. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

b. See Section 20.a. for Nutrient Reporting Calculations.

20. Other Permit Requirements:

a. Part I.B. of the permit contains quantification levels and compliance reporting instructions.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b. Permit Section Part I.C., details the requirements for Whole Effluent Toxicity (WET) Program.

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A WET Program is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics.

As discussed in Fact Sheet Section 18, it is staff's best professional judgment that the WET limitation can be removed with this reissuance. A summary of the past WET test results can be found in Attachment 15 along with the limit evaluation and the determination of the WET endpoints. With this reissuance, the facility shall be required to monitor without limitation for WET on an annual basis using both *C. dubia* and *P. promelas*. The requirements of this testing are found in this section of the permit.

c. Permit Section Part I.D., details the requirements of a Pretreatment Program.

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D requires all discharges to protect water quality. The VPDES Permit Regulation at 9VAC25-31-730 through 900., and the Federal Pretreatment Regulation at 40 CFR Part 403 requires POTWs with a design flow of >5.0 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

The Town of Culpeper WPCF currently receives flow from the following Significant Industrial Users (SIU): Cintas, Rochester, Continental Teves, and the Town of Culpeper WTP. The Town of Culpeper WPCF has an approved Pretreatment Program in place and is required to submit annual reports summarizing the program's activities over the previous year. Specific program requirements and reporting may be found in Part I.D. of the permit.

21. Other Special Conditions:

a. **95% Capacity Reopener.** The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b. **Indirect Dischargers.** Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. **O&M Manual Requirement.** Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. **CTC, CTO Requirement.** The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e. **Licensed Operator Requirement.** The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class I operator.

f. **Reliability Class.** The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of I.

g. **Water Quality Criteria Reopener.** The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h. **Nutrient Offsets**. The Virginia General Assembly, in their 2005 session, enacted a new Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, which are captured by the requirements of the law, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

i. **E3/E4.** 9VAC25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

j. **Nutrient Reopener.** 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

k. **TMDL Reopener.** This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

l. **Inflow & Infiltration**. This special condition requires that the permittee submit annual reports on work done to mitigate inflow and infiltration to the collection system. The 2014 Annual Report (Attachment 16) submitted by the Town compared the 2013 and 2014 inflow and infiltration into the collection system. There was a downward trend in 2014 for inflow and infiltration and the Town continues to slip line sewer pipes and rehabilitate manholes. This special condition shall be carried forward with this reissuance.

22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Permit Section Part III.

Part III of the permit contains conditions and requirements for monitoring and distribution of biosolids. The VPDES Permit Regulation 9VAC25-31-420 through 729 establishes the standards for the use or disposal of biosolids; specifically land application and surface disposal, promulgated under 40 CFR Part 503. Standards consist of general requirements, pollutant limits, management practices and operational standards. Furthermore, VPA Regulation 9VAC25-32-303 through 685 sets forth the requirements pertaining to Class B biosolids. The permit sets forth the parameters to be monitored, monitoring frequencies, sampling types, the Biosolids Reopener Special Condition, the Biosolids Use and Disposal Special Condition, and the Biosolids Management Plan and reporting requirements.

The monitoring frequency for the sewage sludge shall be increased from once per year to once every calendar quarter in accordance with the VPDES Regulation. In the application, the total dry metric tons per 365-day period generated at the facility is 662.9 dry metric tons. Facilities that generate equal to or greater than 290 but less than 1500 dry metric tons shall monitor the sewage sludge on a quarterly basis.

24. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:
   1) The Instream Monitoring Special Condition has been removed since statistical analysis demonstrated that there was no need for limitations for Copper or Zinc.
   2) The Groundwater Monitoring and Corrective Action Plan Special Conditions were removed during the 2011 permit modification.
   3) The Low Level PCB Testing Special Condition was removed since the facility performed all required sampling during this permit term.

b. Monitoring and Effluent Limitations:
   1) The monitoring for Dissolved Copper, Dissolved Zinc, Total Hardness, and Alpha-Endosulfan was removed since there was no reasonable potential for the effluent to exceed the Water Quality Standards and no permit limitations are necessary.
   2) The Whole Effluent Toxicity limitation was removed with this reissuance. The basis for this can be found in Fact Sheet Section 18.
   3) Total Kjeldahl Nitrogen monitoring without limitation was added for the December through May time period. This testing was already being conducted to obtain the weekly Total Nitrogen value.
   4) Sewage sludge monitoring was increased from once per year to once every calendar quarter based on the information provided in the application for reissuance.
   5) With this reissuance, the facility will be given an *E. coli* WLA of 4.58E+12 cfu/year. This revised WLA includes the WLA that was previously assigned to permit VA0090212 Mountain Run WWTP, which has been terminated. Consistent with the Culpeper Nutrient Allocation Agreement, the WLA was derived by adding the WLA previously applied to this permit (3.23E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 6.0 MGD) to the WLA previously applied to the terminated permit (1.35E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 2.5 MGD).

25. Variances/Alternate Limits or Conditions:

There are no variances or alternate limits or conditions.

26. Public Notice Information:

First Public Notice Date: 7/20/2015 Second Public Notice Date: 7/27/2015

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, alison.thompson@deq.virginia.gov. See Attachment 17 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

27. Additional Comments:

Previous Board Action(s): There have been no recent board actions for this facility.

Staff Comments: Staff has no additional comments regarding this reissuance.

Public Comment: Two comments were received from the Town of Culpeper. The first comment was on the necessity of the PCB Pollutant Minimization Plan Special Condition. This condition was placed in the draft permit since the Town had completed monitoring of the effluent for PCBs during the current permit term. While the TMDL has not yet been completed, DEQ did compare the chronic PCB criteria as well as the human health criteria to the effluent concentrations. Since at this time there does not appear to be a need for a PCB Pollutant Minimization Plan, the condition will be removed from the draft permit. Staff advised the town that once the TMDL is completed, reductions could be necessary and the special condition may be included in future VPDES permits.

The Town's second comment was regarding the Total Suspended Solids (TSS) seasonal limitations at the 6.0 MGD flow tier. The Town asked for the TSS limits to be revised to 30/45 mg/L year round. In 2006, the Town requested a modification of the VPDES permit with an effective date of October 1, 2004 to add the 6.0 MGD flow tier to the VPDES permit. DEQ permit staff modeled the stream in August and September 2006 to establish limitations for the expanded flow tier. At that time, DEQ staff established TSS limitations equal to the $CBOD_5$ limitations for each of the seasons. The VPDES permit was modified on March 21, 2007 with the TSS limitations equal to the $CBOD_5$ limitations. On November 4, 2008, the Certificate to Construct the 6.0 MGD was issued by Jimmy Desai, DEQ's Wastewater Engineer. The 6.0 MGD facility was designed to meet the effluent limitations established in the 2007 modification. The facility received the Certificate to Operate the 6.0 MGD plant on April 22, 2010. Since technology has been installed to comply with the current TSS limitations and the facility is meeting those limitations, DEQ has no basis to backslide and relax the TSS limitations presented in the draft permit; therefore, the limitations shall remain as drafted.

ATTACHMENT 1

April 7, 2015
MEMORANDUM

TO: VPDES Reissuance File VA0061590

FROM: Alison Thompson

SUBJECT: Flow Frequency Determination for VPDES Permit No. VA0061590
Town of Culpeper Wastewater Treatment Facility

This flow frequency analysis is necessary for the VPDES permit reissuance for the Town of Culpeper WWTF. The Flow Frequency determination was last done in 2004 and the analysis done then followed the analysis set forth in the 1994 memorandum from Paul Herman. Both the 1994 memorandum and the 2004 analysis are included as part of this analysis for reference. The stream statistics for the reference gage were updated in 2006, so staff believes it is now appropriate to review the values used to establish the wasteload allocations.

Staff reviewed the July 10, 1994 memorandum. Originally an analysis was done using unregulated and regulated flow measurements of the Mountain Run gage #01665000 to determine the critical flow values. Reviewing the 2006 statistics, only the regulated flows are now calculated from this gage station. Since this is the case and the unregulated flow statistics are so old, it is staff's best professional judgment that only the updated regulated flow statistics be used for drainage area comparisons necessary to determine the wasteload allocations and subsequent permit limitations for the Town of Culpeper WWTF.

Staff also confirmed that the water withdrawal from Lake Pelham by the Culpeper Water Treatment Plant has increased since the stream flow analysis was last done. The current annual average withdrawal is 2.16 MGD. The water withdrawal information is also included with this analysis. While in the past staff looked at the seasonal differences in the water withdrawal for the flow determinations, the annual average was used this time since staff does not intend to rerun the dissolved oxygen model with this reissuance.

The calculated flows are presented on the next page. It should be noted that although the flow analysis presents low flows for 7Q10, 1Q10, and 30Q10, staff has not historically allowed any dilution during the low flows due to the design flow of the facility being 6.0 MGD. Since the discharge volume is much greater than the flow in the stream, it is staff's best professional opinion that the instream waste concentration is essentially 100% during critical stream flows, and the water quality of the stream will mirror the quality of the effluent.

Stream flow Analysis for Mountain Run

	Drainage Area (sq mi)	Harmonic Mean	Low Flow 7Q10	High Flow 7Q10*	Low Flow 30Q10	High Flow 30Q10*	Low Flow 1Q10	High Flow 1Q10*	30Q5	1Q30	Units
Gage #01665000 Mountain Run near Culpeper, VA - Regulated Stream flow statistics updated in 2006	15.9	5.7	0.61	3.3	1.1	4.9	0.43	2.8	1.6	0.2	cfs
Mountain Run at Lake Pelham (Drainage Area comparison using gage #01665000)	8	2.87	0.31	1.66	0.55	2.46	0.22	1.41	0.81	0.1	cfs
Add the flows at the gage plus Mountain Run at Lake Pelham	23.9	8.57	0.92	4.96	1.65	7.36	0.65	4.21	2.41	0.3	
Subtract Water Withdrawal from Lake Pelham (Annual Average withdrawal from Jan-Dec 2014)		3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	cfs
Mountain Run flow below the dam	23.9	undefined**	0.0	1.62	0.0	4.02	0.0	0.87	0.0	0.0	cfs
Mountain Run at the Town of Culpeper WWTF (Drainage Area comparison using gage #01665000)	12.3	4.41	0.47	2.55	0.85	3.79	0.33	2.17	1.24	0.15	cfs
Add the flows from below the dam and at the discharge point		4.41	0.47	4.17	0.85	7.81	0.33	3.04	1.24	0.15	cfs
Multiply by 0.6463 to convert flows to MGD		2.85	0.30	2.70	0.55	5.05	0.21	1.96	0.80	0.10	MGD

* High flow period is December-May

**Undefined due to the zero flow for 7Q10 and 1Q10

Thompson, Alison (DEQ)

From: Marsala, Sarah (DEQ)
Sent: Friday, April 03, 2015 1:53 PM
To: Thompson, Alison (DEQ)
Subject: RE: Culpeper WTP
Attachments: Culpeper-LakePehlam_0479VWUDS_2015-04-03.xlsx

Alison,

I pulled the annual water withdrawal data reported to DEQ for this facility. Based upon that information, they reported a maximum day withdrawal of 3.5 mgd in July 2011 and in 2014, an annual average of 2.16 mgd. The data is attached. There is not a VWP permit for this facility.

Let me know if you need anything else.

Sarah K. Marsala

Surface Water Withdrawal Project Manager
Office of Water Supply
VA Dept. of Environmental Quality
13901 Crown Court, Woodbridge, VA 22193
703-583-3898 (direct)
703-583-3821 (fax)
sarah.marsala@deq.virginia.gov
www.deq.virginia.gov

From: Thompson, Alison (DEQ)
Sent: Thursday, April 02, 2015 7:51 AM
To: Marsala, Sarah (DEQ)
Cc: Thompson, Alison (DEQ)
Subject: Culpeper WTP

Sarah,

I am working on the stream flow analysis for the Town of Culpeper's wastewater facility. Part of the analysis involves the water withdrawal from Lake Pelham by the Culpeper Water Treatment Plant. The last analysis done noted that the maximum withdrawal for the water plant was 1.9 cfs (about 1.2 MGD). Would you know if this is still an accurate estimate?

thanks

Alison Thompson
Water Permits Technical Reviewer
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facility	system	ownname	SOURCE	USERID	ACTION	MPID	vwuds_type	total_mgy	total_mgd	MAXDAY	MAXMONTH	YEAR	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	ANNUAL/365	METHOD	method_desc	metertype	ENTITY	ACCURACY	RESTRICT
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	0	0	0	0	1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	380.978	1.043775	0	0	1984	32.705	30.996	30.194	28.98	30.411	32.4	32.209	31.806	31.5	35.309	31.98	32.488	380.978	1.043775	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	392.443	1.075186	0	0	1985	32.488	28.196	31.496	32.19	33.201	31.98	34.379	35.495	33	34.813	32.19	33.015	392.443	1.075186	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	430.627	1.1798	0	0	1986	33.604	29.008	32.891	34.11	37.789	39.9	38.502	37.51	36	39.091	36.51	35.712	430.627	1.1798	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	384.474	1.053353	0	0	1987	32.701	30.692	34.994	30.623	32.828	31.669	34.947	34.684	31.339	32.701	29.429	27.867	384.474	1.053353	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	377.2	1.033425	0	0	1988	29.3	27.2	30.1	30.2	30.5	33.7	34.7	35.5	31.8	32.2	30.6	31.4	377.2	1.033425	E	S	S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	390.7	1.070411	1	10	1989	30.9	27.2	30.2	23.8	33.4	35.6	36.1	35.4	33.8	36.6	32.9	34.8	390.7	1.070411	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	421.582	1.155019	1	0	1990	34.658	29.4	33.666	34.2	36.115	35.37	36.022	37.138	35.79	37.882	36.9	34.441	421.582	1.155019	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	438.35	1.200959	0	4	1991	35	32.3	34.7	37.1	38.5	38.25	38.9	38.7	36.6	39.8	35	33.5	438.35	1.200959	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	418.95	1.147808	0	0	1992	33.6	30.7	33	34.9	34.7	35.1	38.7	35.5	35.25	36.7	33.8	37	418.95	1.147808	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	525.664	1.440175	2	0	1994	48.46	46.758	47.893	44.401	44.226	45.093	45.591	41.778	41.904	41.954	41.474	36.132	525.664	1.440175	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	507.253	1.389734	0	0	1995	39.272	36.724	44.048	42.21	41.684	41.533	44.039	48.089	43.622	43.85	42.15	40.032	507.253	1.389734	M		S	OWNER		N
CULPEPER	[redacted]	[redacted]			WL	382808078	[redacted]	490.941	1.345044	2.073	0	1996	41.075	38.432	39.723	40.405	40.93	41.054	42.359	42.189	42.518	42.824	39.694	39.738	490.941	1.345044	M		S	OWNER		n
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	471.348	1.291364	2.527	0	1997	40.413	38.109	40.769	41.511	42.207	42.499	48.848	47.389	44.211	44.634	40.758	0	471.348	1.291364	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	517.692	1.418334	2.166	12	1998	41.139	37.574	40.658	41.242	43.17	41.276	46.787	44.606	47.302	45.566	43.098	45.274	517.692	1.418334	M		S	OWNER		
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	533.1	1.460548	2.2	1	1999	48.7	41	46.2	46.1	48.5	47.7	47.6	45.8	36.8	42.8	40.5	41.4	533.1	1.460548	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	544	1.490411	1.993	8	2000	41.1	41.7	43.9	43.1	47.5	46.4	46.1	49.2	46.5	46	44.1	48.4	544	1.490411	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	522.7	1.432055	2.033	7	2001	44.7	38.4	43.5	42	45.5	44.4	46.6	46.1	43.5	47	40.4	40.6	522.7	1.432055	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	516.249	1.414381	2.73	11	2002	41.667	36.68	40.902	42.156	43.54	44.868	46.953	49.194	43.557	43.991	43.083	39.658	516.249	1.414381	M		S	OWNER		N
CULPEPER	[redacted]	[redacted]			WL	382808078	[redacted]	515.22	1.411562	2.067	8	2003	39.7	35.875	41.081	42.422	40.823	42.174	46.512	48.32	44.096	48.64	41.425	44.152	515.22	1.411562	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	616.991	1.690386	2.304	9	2004	43.287	41.746	45.778	46.557	51.036	52.64	56.972	56.721	56.651	57.37	53.557	54.676	616.991	1.690386	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	731.176	2.003222	2.817	6	2005	54.879	51.872	57.677	59.985	62.411	65.029	64.079	67.985	65.37	61.189	60.339	60.361	731.176	2.003222	M		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	694.954	1.903984	3.062	8	2006	57.218	47.081	54.937	55.907	61.209	66.109	63.772	73.9	59.968	52.279	51.73	50.844	694.954	1.903984	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	757.8	2.076164	3.5	8	2007	51.2	46.5	53.1	56.3	62.9	62.5	73.6	80.3	70.4	72.1	63.9	65	757.8	2.076164	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	756.4	2.072329	3	9	2008	59.7	55.8	65.1	67.4	66.1	65.8	71.4	68.2	65.2	62.1	61.2	48.4	756.4	2.072329	M		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	707.6	1.93863	3.3	7	2009	55.9	49.4	56.2	58	61.7	62.5	70.4	64.1	59	58.7	55.6	56.1	707.6	1.93863	M		S			
CULPEPER	[redacted]	[redacted]			WL	382808078	[redacted]	717.52	1.965808	2.75	9	2010	56.75	48.87	54.99	57.27	61.7	62.3	66.65	63.75	66.35	60.59	59.18	59.12	717.52	1.965808	M		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	739.24	2.025315	3.5	7	2011	56.51	51.97	58.69	56.41	64.2	66.21	72.02	68.96	62.59	62.51	61.11	58.06	739.24	2.025315	M		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	788.1	2.159178	0	0	2012	61.09	57.9	64.61	66.12	71.04	70.34	71.81	69.86	63.92	65.51	66.73	59.17	788.1	2.159178	E		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	769.55	2.108356	0	0	2013	63.48	56.63	59.39	63.03	66.23	65.41	73.79	67.8	64.48	66.8	62.48	60.03	769.55	2.108356	E		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	787.88	2.158575	0	0	2014	60.82	54.92	60.43	58.84	64.48	71.67	68.52	67.45	64.62	72.88	68.85	74.4	787.88	2.158575	E		S			
CULPEPER	CULPEPER, CULPEPER, LAKE PELH	0479			WL	382808071	SW	0	0	0	0	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	634.35	1.7379452	2.865	8	2006	53.654	43.562	50.651	50.221	58.24	62.614	58.454	68.578	53.562	45.294	44.536	44.984	634.35	1.7379452	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	641.5	1.7575342	2.6	9	2008	49	45.5	52.3	55	55.1	57.3	61.9	59.2	54.4	52.9	50.5	48.4	641.5	1.7575342	M		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	496.7	1.3608219	1.922	7	2000	38.2	38.1	39.7	39.4	43.4	42.7	42.7	45.5	41.3	41.2	38.7	45.8	496.7	1.3608219	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	462.625	1.2674657	2.65	11	2002	37.883	34.073	36.397	37.582	39.129	40.274	42.426	44.152	38.523	38.607	37.983	35.596	462.625	1.2674657	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	630.73	1.7280273	3.01	9	2010	49.54	42.85	47.52	50.32	54.85	56.6	59.09	56.3	57.45	52.25	52.77	51.19	630.73	1.7280273	M		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	380.978	1.0437753	0	0	1984	32.705	30.996	30.194	28.98	30.411	32.4	32.209	31.806	31.5	35.309	31.98	32.488	380.978	1.0437753	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		N
CULPEPER	[redacted]	[redacted]	[redacted]	[redacted]	TW	390.7	1.0704109	3.390411	0	1989	30.9	27.2	30.2	23.8	33.4	35.6	36.1	35.4	33.8	36.6	32.9	34.8	390.7	1.0704109	3.390411		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	384.474	1.0533534	0	0	1987	32.701	30.692	34.994	30.623	32.828	31.669	34.947	34.684	31.339	32.701	29.429	27.867	384.474	1.0533534	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	392.443	1.0751863	0	0	1985	32.488	28.196	31.496	32.19	33.201	31.98	34.379	35.495	33	34.813	32.19	33.015	392.443	1.0751863	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	371.213	1.0170219	0	0	1983	28.086	24.612	27.993	27.09	28.799	29.7	30.008	36.208	33.99	36.115	33.21	35.402	371.213	1.0170219	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	357.74	0.9801095	0	0	1982	32.116	30.907	26.877	27.528	31.837	31.651	31	30.504	30.69	29.574	28.086	26.97	357.74	0.9801095	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		N
CULPEPER	[redacted]	[redacted]	[redacted]	[redacted]	TW	0	0	0	0	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	489.3	1.3405479	1.88	1	1999	42.5	37.3	41.6	42.5	44.7	44.1	43.7	42.7	34	40	37.8	38.4	489.3	1.3405479	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	462.91	1.2682465	1.788	8	2003	36.179	31.657	37.002	37.252	37.484	38.437	42.122	43.903	39.729	42.12	37.325	39.7	462.91	1.2682465	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	549.914	1.5066136	2.128	7	2004	39.316	37.625	40.36	40.829	45.874	46.832	50.367	49.972	50.708	51.649	47.787	48.595	549.914	1.5066136	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	473.8	1.2980821	1.894	7	2001	40.3	35	38.6	38.1	41.8	40.1	43.2	42.5	39.2	41	36.9	37.1	473.8	1.2980821	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	632.5	1.7328767	2.9	8	2007	45.3	41	48.9	51.2	51.4	58.1	62.3	61.6	58	58	48.5	48.2	632.5	1.7328767	M		S	OWNER		N
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	682.07	1.8686849	3.4	7	2012	51.12	51.47	56.69	58.34	62.78	62.29	63.55	58.56	54.88	54.74	56.82	50.83	682.07	1.8686849	M		S			
CULPEPER	[redacted]	[redacted]	[redacted]	[redacted]	TW	0	0	0	0	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	662.63	1.8154246	0	0	2013	54.18	48.37	52.07	53.7	57.38	56.24	64.39	58.37	56.44	57.15	53.2	51.14	662.63	1.8154246	E		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	739.04	2.0247671	3	7	2011	56.15	51.97	58.69	56.14	64.2	66.21	72.08	68.96	62.96	62.51	61.11	58.06	739.04	2.0247671	M		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	608.999	1.6684904	2.86	7	2009	48.471	43.991	48.586	48.033	51.084	53.157	59.774	56.954	51.346	51.177	48.59	47.836	608.999	1.6684904	M		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	673.601	1.8454821	2.741	6	2005	49.251	45.843	51.276	53.277	56.927	61.35	61.081	63.536	62.191	58.045	55.51	55.314	673.601	1.8454821	M		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E		S			
CULPEPER	CULPEPER, CULPEPER, TO SERVICI	0479	SR	0299	TW	0	0	0	0	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M		S	OWNER		N

SALINITY	REGION	OTHERC	REVISED_ON	REVISED_BY	CROP1	CROP2	ACRES	recid	record_id	groupid	ownerid	operms	pperms	gperms	TYPE	SUBTYPE	SIC_MP	CAT_MP	GWPERMIT	VWP_PERMIT	VPDES	VDH_NUM	WELLNO	DEQ_WELL	stcofips	county	inactive	abandoned	SUBYR_MP	ADDYR_MP	R_BASIN	HUC_MP
F	N							9613	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9614	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9615	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9616	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9617	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
	N			EWM				9618	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9619	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9620	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
	N			EWM				9621	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				9622	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				31255	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
F	N			EWM				37174	4394	3	24	6	4	6	SW	RE	4941	PWS			6047500	6047500			51047	Culpeper	0	0			RA	02080103
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Mountain Run Flow Data (1950 - 1997)
Based on Flow Determination Memo - April 9, 1999

SITEID	NAME	Drainage Area	Harmonic Mean	High Flow 7Q10	High Flow 1Q10	30Q5	7Q10	1Q10	30Q10*	1Q30	
01665000	Mountain Run near Culpeper, Va. - Unregulated	*15.9*	*4*	*3.7*	*2.7*	*0.7*	*0.2*	*0.14*		*N/A*	
01665000	Mountain Run near Culpeper, Va. - Regulated	15.9	6.4	3.6	2.9	1.9	1	0.79	1.1	N/A	
	Mountain Run @ Lake Pelham	8	2	1.9	1.4	0.35	0.1	0.07	0.36	N/A	
		23.9	**8.4**	**5.5**	**4.3**	**2.25**	**1.1**	**0.86**	**1.46**		
	Water Withdrawal from Lake Pelham		-	1.9	1.9	1.9	1.9	1.9	1.9		
	Mountain Run flow below Dam	23.9	**0.00**	**3.60**	**2.40**	**0.35**	**0.00**	**0.00**	**0.00**		
	Mountain Run @ Town of Culpeper WWTP ** (Drainage Area Comparison based on unregulated data from 1950 - 1958)	12.3	**3.09**	**2.86**	**2.09**	**0.54**	**0.15**	**0.11**	**N/A**		**cfs**
	Add flow below Dam		**3.09**	**6.46**	**4.49**	**0.89**	**0.15**	**0.11**	**N/A**		**cfs**
			2.00	**4.17**	**2.90**	**0.58**	**0.10**	**0.07**	**N/A**		**mgd**

* 30Q10 flow as per G. Powell - 3/8/04

** Drainage Area from dam to Culpeper WWTP

Attachment 1

To: Carlos M. Garay@WDBR1@DEQ
Cc:
Bcc:
From: Paul E. Herman@WQA@DEQ
Subject: Culpeper STP
Date: Friday, August 7, 1998 15:27:31 EDT
Attach: a:m-culpep.nro
Certify: Y
Forwarded by:

Carlos,

The flow memo I prepared back in July 1994 is still applicable. The flow frequencies for the gage haven't change significantly since the analysis was conducted. Please use the flow frequencies presented in the July 1994 memo for the Culpeper AWT facility during this permit reissuance.

Paul

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Town of Culpeper WTP - VA#0087742
Town of Culpeper AWT - VA#0061590

TO: Jan Pickrel, NRO

FROM: Paul Herman, OWRM-WQAP

DATE: July 10, 1994

COPIES: Ron Gregory, Charles Martin, Dale Phillips, Curt Wells, File

The Town of Culpeper has requested, through their consultant, re-evaluation of flow statistics for Mountain Run, the receiving stream for discharges from the Culpeper AWT and WTP. The Town's consultant questioned the use of the entire period of record at the Mountain Run near Culpeper, VA stream gage to represent flows into Lake Pelham. The period of record includes unregulated (1950-1958) and regulated (1959-present) flow data. Also questioned was the drainage area between the Lake Pelham Dam and the AWT outfall and the use of Lake Pelham's safe yield in determining the flow statistics below the lake.

This re-evaluation uses both the regulated and unregulated period of record to represent flow into Lake Pelham. The regulated period of record represents flow contributed from the Mountain Run watershed above the gage while the unregulated period of record is used to determine the flow contributed by the watershed between the gage and the Pelham Dam and between the Dam and the WTP and AWT outfalls. This re-evaluation uses water withdrawal information provided by the Town of Culpeper when determining flow statistics for Mountain Run below the dam in lieu of the safe yield established for Lake Pelham. This re-evaluation uses new drainage area figures determined for the watershed between the Dam and the WTP and AWT outfalls.

Listed below are the flow frequencies for the unregulated and regulated period of record at the Mountain Run stream gage.

Mountain Run near Culpeper, VA (#01665000) 1950-1958:

Drainage Area = 15.9 mi^2

1Q10 = 0.14 cfs	High Flow 1Q10 = 2.7 cfs
7Q10 = 0.20 cfs	High Flow 7Q10 = 3.7 cfs
30Q5 = 0.70 cfs	HM = 4.0 cfs

Mountain Run near Culpeper, VA (#01665000) 1959-1992:

1Q10 = 0.74 cfs	High Flow 1Q10 = 2.8 cfs
7Q10 = 0.98 cfs	High Flow 7Q10 = 3.4 cfs
30Q5 = 1.8 cfs	HM = 6.2 cfs

The high flow months are December through May.

Listed below are the flow frequencies for the unregulated watershed which drains into Lake Pelham between the Dam and the gage. The values listed below were determined using drainage area proportions and do not address any springs or discharges which may contribute to the flow between the gage and the dam. The Town of Culpeper's maximum water withdrawal during the high flow months was 1.242 mgd (1.922 cfs) and occurred during May 1991. During the low flow months the Town's maximum withdrawal was 1.283 mgd (1.985 cfs) and occurred during October 1991.

Drainage Area = 8.0 mi^2

1Q10 = 0.07 cfs	High Flow 1Q10 = 1.4 cfs
7Q10 = 0.10 cfs	High Flow 7Q10 = 1.9 cfs
30Q5 = 0.35 cfs	HM = 2.0 cfs

Adding together the regulated and unregulated flows into Lake Pelham and subtracting the withdrawal from the Lake by the Town of Culpeper, the resulting flows in Mountain Run below the dam are listed below:

Drainage Area = 15.9 + 8.0 = 23.9 mi^2

1Q10 = 0.74 + 0.07 - 1.985 = 0.0 cfs
7Q10 = 0.98 + 0.10 - 1.985 = 0.0 cfs
30Q5 = 1.8 + 0.35 - 1.985 = 0.165 cfs
High Flow 1Q10 = 2.8 + 1.4 - 1.922 = 2.278 cfs
High Flow 7Q10 = 3.4 + 1.9 - 1.922 = 3.378 cfs
HM = undefined due to zero flows

The unregulated period of record for the gage was used to determine the flow contributed to Mountain Run by the watershed between the dam and the WTP outfall.

Mountain Run between the Dam and the WTP discharge point:

Drainage Area = 0.78 mi^2

1Q10 = 0.007 cfs	High Flow 1Q10 = 0.13 cfs
7Q10 = 0.010 cfs	High Flow 7Q10 = 0.18 cfs
30Q5 = 0.034 cfs	HM = 0.20 cfs

Mountain Run at the WTP discharge point:

Drainage Area = 23.9 + 0.78 = 24.68 mi^2

1Q10 = 0.0 + 0.007 = 0.007 cfs
7Q10 = 0.0 + 0.010 = 0.010 cfs
30Q5 = 0.165 + 0.034 = 0.199 cfs
High Flow 1Q10 = 2.278 + 0.13 = 2.408 cfs

Mountain Run at the WTP dsicharge Point continued:

High Flow 7Q10 = 3.378 + 0.18 = 3.558 cfs
HM = undef + 0.20 = 0.20 cfs

Moving downstream to the Culpeper AWT the Mountain Run picks up an additional 11.51 mi^2 of unregulated drainage area. The flows contributed by this watershed are listed below:

1Q10 = 0.101 cfs	High Flow 1Q10 = 1.955 cfs
7Q10 = 0.145 cfs	High Flow 7Q10 = 2.678 cfs
30Q5 = 0.507 cfs	HM = 2.896 cfs

Adding the flows at the WTP to the flows contributed by the drainage area between the AWT and WTP outfalls:

Drainage Area = 24.68 + 11.51 = 36.19 mi^2

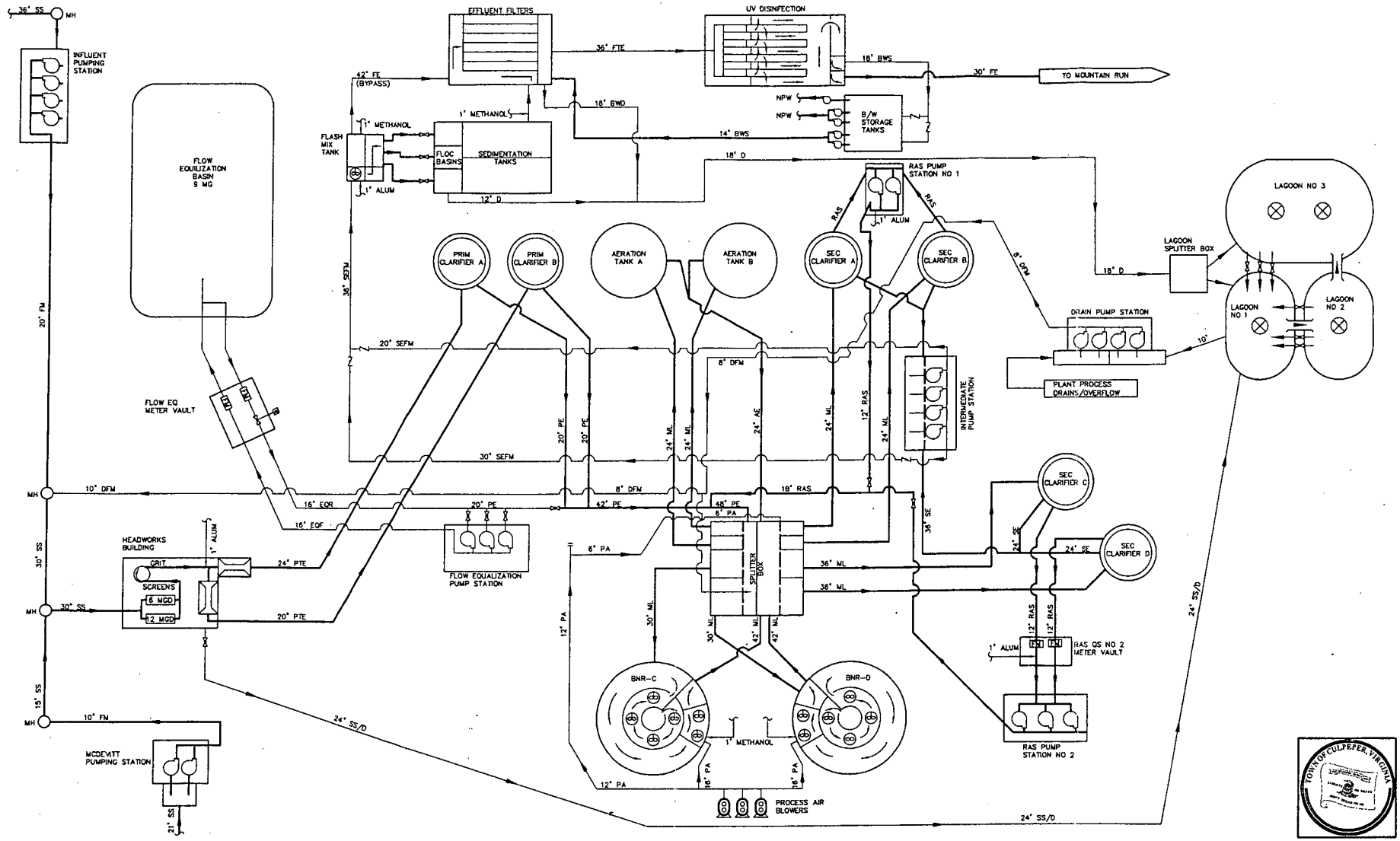
1Q10 = 0.007 + 0.101 = 0.108 cfs 0.07 mgd
7Q10 = 0.010 + 0.145 = 0.155 cfs 0.100 mgd
30Q5 = 0.199 + 0.507 = 0.706 cfs 0.46 mgd
High Flow 1Q10 = 2.408 + 1.955 = 4.363 cfs
High Flow 7Q10 = 3.558 + 2.678 = 6.236 cfs 4.03 mgd
HM = 0.20 + 2.896 = 3.096 cfs

The flow frequencies listed in this memo were determined using the regulated and unregulated period of record from the Mountain Run near Culpeper, VA stream gage (#01665000). This

analysis also includes recalculated drainage area figures for the watershed between the Lake Pelham Dam and the WTP and AWT outfalls downstream. This new analysis takes into consideration the withdrawals from the Lake Pelham as reported by the Town of Culpeper under Virginia's Water Withdrawal Reporting Regulation (VR 680-15-01). This analysis does not address any other withdrawals, springs, or discharges which may influence the flows in the Mountain Run between the gaging station and the WTP and AWT discharge points.

If you have any questions concerning this analysis, please let me know.

ATTACHMENT 2



LIQUIDS PROCESS FLOW DIAGRAM

CULPEPER WATER POLLUTION CONTROL FACILITY

R3

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

April 22, 2010

Mr. Chris Hively, P. E.
Town of Culpeper
Director of Environmental Services
400 South Main Street
Culpeper, VA 22701

Culpeper County
Town of Culpeper STW

Dear Mr. Hively:

Enclosed is the Certificate to Operate (CTO) for the above mentioned facility. This action is in accordance with the Virginia *Sewage Collection and Treatment Regulations.*

If you have any questions regarding the CTO, please feel free to contact this office.

Sincerely,

J. S. Desai, P. E.
CBP/Wastewater Engineering
Northern Regional Office

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

CERTIFICATE TO OPERATE

Owner: Town of Culpeper

Facility/System Name: Culpeper STW

VPDES Permit Number: VA0061590

Description of the Facility/System: Flow equalization, five-stage "Bardenpho" activated sludge process, secondary clarifies, deep bed denitrification filters, Ultraviolet (UV) disinfection, gravity belt thickener, alum addition for phosphorous removal, methanol (carbon source) addition for denitrification and related appurtenances.

Authorization to Operate: The owner's consulting engineer has certified in writing that the installation has been constructed as per the approved plans and specifications. Therefore, the owner has authorization to operate the facility, with the following conditions:

1. A revised Operation and Maintenance Manual for the Town of Culpeper STW must be submitted to the Northern Regional Office for evaluation and approval in accordance with the VPDES Permit for this facility.

2. The Flow Equalization Basin must be provided with appropriate aeration if odor complaints persist from facility employees, visitors, or general residents of the Town of Culpeper or Culpeper County.

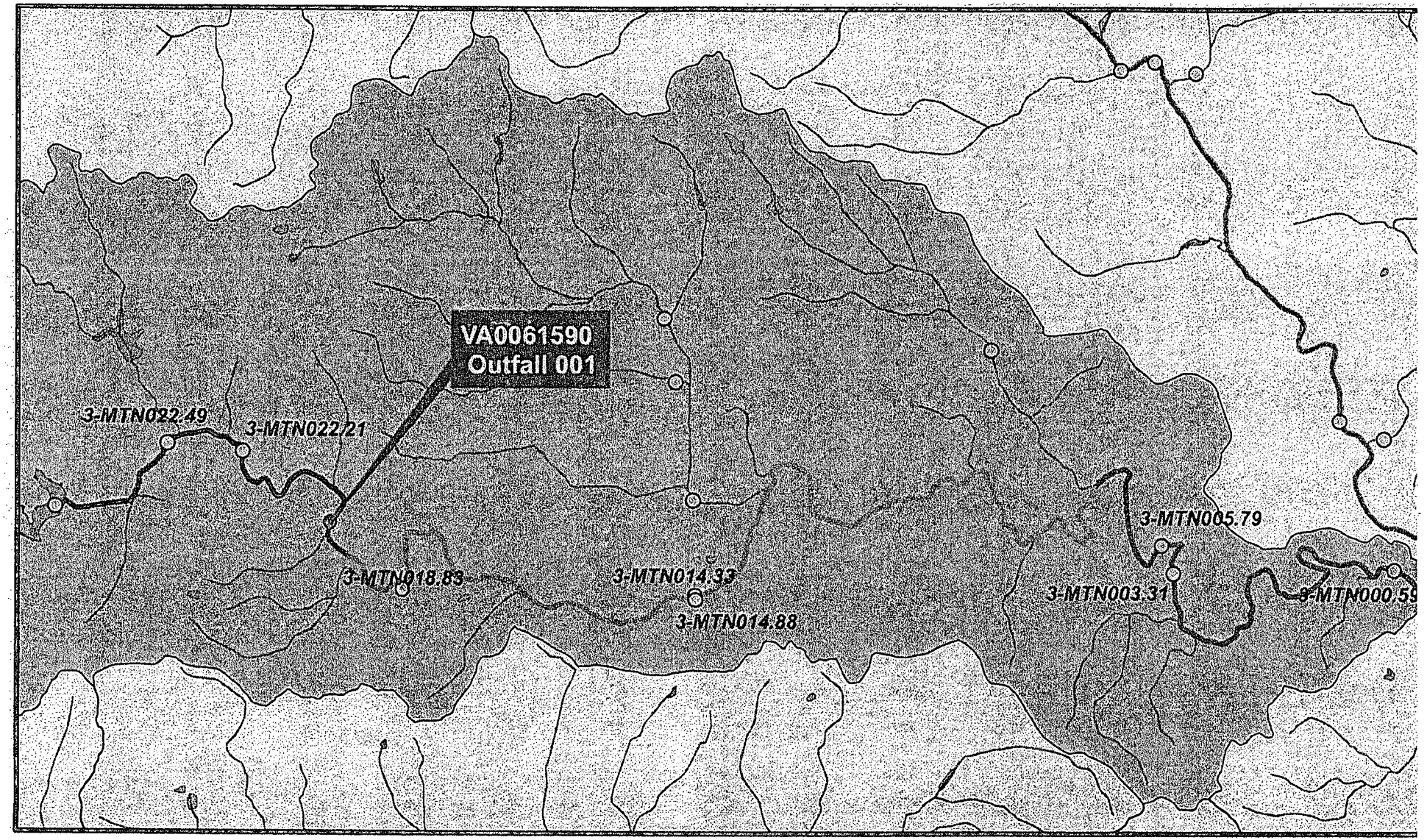
3. If BOD_5 values in effluent exceed the permitted values, means for automatically pacing the carbon source feed to the incoming nitrate concentration must be provided at this facility.

ISSUANCE:

J. S. Desai, P. E.
CBP/Wastewater Engineering

Date: April 22, 2010

ATTACHMENT 3



Assessment Units for Mountain Run

- VAN-E09R_MTN01A00
- VAN-E09R_MTN02A04
- VAN-E09R_MTN03A00
- VAN-E09R_MTN04A04

- Rivers and Streams
- County Boundaries
- Mountain Run Watershed
- Rappahannock River Watershed
- DEQ Monitoring Stations - 2008 Assessment

0 0.5 1 2 Miles

ATTACHMENT 4

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193

Molly Joseph Ward
Resources

(703) 583-3821 Fax (703) 583-3821
www.deq.virginia.gov

David K. Paylor

Thomas A. Faha
Regional Director

November 20, 2014

Chris Hively
Town Manager
Town of Culpeper
400 South Main St.
Culpeper, VA 22701

Re: **Culpeper WWTP – Permit VA0061590 Technical and Laboratory Inspection**

Dear Mr. Hively:

Attached is a copy of the Inspection Report generated while conducting a Facility Technical and Laboratory Inspection at the Town of Culpeper WWTP on October 21, 2014. This letter is not intended as a case decision under the Virginia Administrative Process Act, Va. Code § 2.2-4000 *et seq.* (APA). The compliance inspection staff would like to thank Mr. Jim Hust and Mr. Robert Cheney for their time and assistance during the inspection.

Please note the requirements and recommendations addressed in the technical summary, and submit in writing, a progress report to this office by December 20, 2014. Your response may be sent either via the US Postal Service or electronically, via E-mail. If you choose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office at (703) 583-3801 or by E-mail at Lisa.Janovsky@deq.virginia.gov.

Lisa H Janovsky

Lisa Janovsky
Environmental Specialist II

cc: Permit/DMR File;
Water Compliance Manager

DEQ

WASTEWATER FACILITY INSPECTION REPORT

PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0061590	**March 10, 2010**	**December 12, 2011**	**March 9, 2015**

Facility Name	Address	Telephone Number
Town of Culpeper WWTP	**15108 Service La. Culpeper, VA 22701**	**540-825-1199**
Owner Name	Address	Telephone Number
Town of Culpeper	**400 South Main St. Culpeper, VA 22701**	**540-829-8251**
Responsible Official	Title	Telephone Number
Chris Hively	**Town Manager**	**540-829-8251**
Responsible Operator	Operator Cert. Class/number	Telephone Number
Jim Hust	**Class I/1965004134**	**540-825-1199**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major	X	Major		Primary	
Non-federal	X	Minor		Minor		Secondary	

INFLUENT CHARACTERISTICS:		DESIGN:
	Flow	**6.0 MGD**
	Population Served	**17,145**
	Connections Served	**6,576**
	BOD_5 **(July-Sept 2014)**	**221**
	TSS **(July-Sept 2014)**	**375**

EFFLUENT LIMITS: **mg/L unless otherwise specified**

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
pH	**6.0**		**9.0**	**DO**	**6.5**		
$CBOD_5$ (Jun-Nov)		**8**	**12**	**BOD_5 (Dec-May)**		**12**	**18**
TSS (Jun-Nov)		**8**	**12**	**TSS (Dec-May)**		**12**	**18**
TKN		**3.0**	**4.5**	**Ammonia-N (Dec-May)**		**3.7**	**4.5**
E.coli n/100mL		**126**		**E.coli (12 month max)**			**3.23E+12**
TN-Calendar Year		**4.0**		**TP-Calendar Year**		**0.30**	

Receiving Stream	**Mountain Run**	
Basin	**Rappahannock River**	
Discharge Point (LONG)	**77° 58' 08"**	
Discharge Point (LAT)	**38° 27' 56"**	

Problems identified at last inspection: **February 25, 2011**	Corrected	Not Corrected
1. **The influent and effluent flow meters were not marked with the calibration dates.**	[ ]	[X]
2. **There was some erosion (rills) on the southwest corner of the new EQ basin**	[X]	[ ]
3. **The walls of the sludge storage sheds had been pushed out in places and dried sludge had spilled onto the ground.**	[X]	[ ]
4. **The primary and secondary clarifier weirs were dirty**	[ ]	[X]

Technical Inspection Summary

The following improvements were observed during the inspection:

- **The concrete walls of the sludge storage sheds have been lined with wood in order to contain the sludge. DEQ walked around the building and there was no sludge present on the ground.**

Comments/Recommendations for Action from the Current Inspection on October 21, 2014:

- **The leak around the influent pipe in the influent pump station dry well is still present - the walls and floor were wet (photos 2 & 3). To ensure worker health and safety, DEQ recommends sampling the leak for Fecal Coliform in order to verify that the source of water is groundwater. Please provide a plan of action and timeline to address this issue.**
- **An alarm light was flashing at the electric meter panel located in the influent pump station. Provide an update to DEQ when this will be fixed.**
- **The primary clarifiers had some floating solids, a few plastics, and algae on the weirs. The secondary clarifiers looked OK. DEQ recommends increasing the cleaning frequency of the clarifiers.**
- **DEQ noticed burrowing animal holes, which went underneath primary clarifier #1.**
- **The thermometer in the final effluent sampler had an outdated certification sticker on it. However, the actual calibration was completed on August 22, 2014 and documentation was provided to DEQ. Outdated calibration stickers are repeat deficiencies.**
- **DEQ noticed some general housekeeping issues: polymer on floor near unused mixing equipment and some hoses and spare equipment spread around (photos 8 & 9). Recommend increasing the monitoring and maintenance of these areas.**
- **The Hach SC100 display screen, which showed the transmittance value at the UV disinfection, was very hard to read. DEQ highly recommends fixing or replacing the display screen.**

VPDES NO. **VA0061590**

DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1

Inspection date: **10/21/2014**

Date form completed: **11/20/2014**

Inspection by: **Lisa Janovsky**

Inspection agency: **DEQ**

Total Time Spent: **55 hours**

Announced: **No**

Reviewed by:

Scheduled: **Yes**

Present at inspection: **Sharon Allen-DEQ**
Amy Dooley-DEQ
Jim Hust - Town of Culpeper WWTP; Class I Operator
Robert Cheney - Class II Operator

TYPE OF FACILITY:

Domestic
[ ] Federal [**X**] Major
[**X**] Nonfederal [ ] Minor

Industrial
[ ] Major [ ] Primary
[ ] Minor [ ] Secondary

Type of inspection:

[**X**] Routine
[ ] Compliance/Assistance/Complaint
[ ] Reinspection

Date of last inspection: **January 19, 2011**
Agency: **DEQ NRO**

Population served: approx. **17,145**

Connections served: approx. **6,576**

Last month: (Influent) **September 2014**

$CBOD_5$: **249 mg/L** TSS: **492 mg/L**

Last month: (Effluent) **September 2014**

Flow:	**2.32**	MGD	pH	**7.6**	SU	D.O.	**8.3**	mg/L
$CBOD_5$	**<QL**	mg/L	TSS	**<QL**	mg/L	E.coli	**1**	n/100mls
NO_2+NO_3	**0.31**	mg/L	TKN	**0.66**	mg/L			
Total Nitrogen	**1.16**	mg/L	TP	**0.025**	mg/L			

Quarter average: (Effluent) **July-September 2014**

Flow:	**2.6**	MGD	pH	**7.5**	SU	D.O.	**8.1**	mg/L
$CBOD_5$	**<QL**	mg/L	TSS	**<QL**	mg/L	E.coli	**1**	n/100mls
NO2+NO3	**0.91**	mg/L	TKN	**0.61**	mg/L			
TN	**1.17**	mg/L	TP	**0.029**	mg/L			

DATA VERIFIED IN PREFACE [**X**] Updated [ ] No changes

Has there been any new construction? [**X**] Yes [ ] No
Town of Culpeper Force Main and Pump station located in Culpeper County

If yes, were plans and specifications approved? [**X**]Yes [ ]No []NA

DEQ approval date: **October 8, 2014 –CTO issued on this date**

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: I -**2** II - **2** III - **0** IV - **4** Trainee - **0**

2. Hours per day plant is manned: **24 hours/7 days per week**

3. Describe adequacy of staffing. [ ] Good [**X**] Average [ ] Poor

4. Does the plant have an established program for training personnel? [**X**]Yes [ ] No

5. Describe the adequacy of the training program. [**X**] Good [ ] Average [ ] Poor

6. Are preventive maintenance tasks scheduled? [**X**]Yes [ ] No

7. Describe the adequacy of maintenance. [ ] Good [**X**] Average [ ] Poor*

8. Does the plant experience any organic/hydraulic overloading?
   If yes, identify cause and impact on plant: [ ] Yes [**X**] No

9. Any bypassing since last inspection? [ ] Yes [**X**] No

10. Is the standby electric generator operational? [**X**] Yes [ ] No* [ ] NA

11. Is the STP alarm system operational? [**X**] Yes [ ] No* [ ] NA

12. How often is the standby generator exercised? **All generators tested once per week**
    Power Transfer Switch? **Once per week**
    Alarm System? **Once per week**

13. When was the cross connection control device last tested on the potable water service? **January 24, 2014**

14. Is sludge being disposed in accordance with the approved sludge disposal plan? [**X**] Yes [ ] No [ ] NA

15. Is septage received by the facility? [**X**] Yes [ ] No
    Is septage loading controlled? [**X**] Yes [ ] No
    Are records maintained? [**X**] Yes [ ] No

16. Overall appearance of facility: [**X**] Good [ ] Average [ ] Poor

Comments:

- **The plant utilizes 4 generators for the operation. The generator at the influent pump station was installed in 2010. The old generator for this pump station is still onsite and is used as a backup. The new administration building and Public Works building have small generators and there are 2 portable generators onsite for the pump stations.**

- **The adequacy of staffing could use improvement along with general housekeeping (see technical summary for details).**

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[X] Yes	[ ] No	[ ] NA
Instrument maintenance and calibration	[X] Yes	[ ] No	[ ] NA
Mechanical equipment maintenance	[X] Yes	[ ] No	[ ] NA
Industrial waste contribution (Municipal Facilities)	[X] Yes	[ ] No	[ ] NA

2. What does the operational log contain?

[X] Visual observations	[X] Flow measurement
[X] Laboratory results	[X] Process adjustments
[X] Control calculations	[ ] Other (specify)

Comments:

3. What do the mechanical equipment records contain?

[ ] As built plans and specs	[X] Spare parts inventory
[X] Manufacturers instructions	[X] Equipment/parts suppliers
[ ] Lubrication schedules	[ ] Other (specify)

Comments:

4. What do the industrial waste contribution records contain (Municipal Only)?

[ ] Waste characteristics	[ ] Locations and discharge types
[ ] Impact on plant	[ ] Other (specify)

Comments: **N/A**

5. Which of the following records are kept at the plant and available to personnel?

[ ] Equipment maintenance records	[X] Operational Log
[ ] Industrial contributor records	[X] Instrumentation records
[X] Sampling and testing records	

6. Records not normally available to plant personnel and their location:

7. Were the records reviewed during the inspection?	[X] Yes	[ ] No
8. Are the records adequate and the O & M Manual current?	[X] Yes	[ ] No
9. Are the records maintained for the required 3-year time period?	[X] Yes	[ ] No

Comments:

- **No problems observed**

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? [X] Yes [ ] No*
2. Do sample types correspond to those required by the VPDES permit? [X] Yes [ ] No*
3. Do sampling frequencies correspond to those required by the VPDES permit? [X] Yes [ ] No*
4. Are composite samples collected in proportion to flow? [X] Yes [ ] No* [ ] NA
5. Are composite samples refrigerated during collection? [X] Yes [ ] No* [ ] NA
6. Does plant maintain required records of sampling? [X] Yes [ ] No*
7. Does plant run operational control tests? [X] Yes [ ] No

Comments:
- **None**

(D) TESTING

1. Who performs the testing? [X] Plant [ ] Central Lab [X] Commercial Lab

Name:
- **The operators conduct pH, E.Coli, TSS, Ammonia as N, TKN, BOD, and CBOD analysis inside their VELAP certified laboratory and they conduct D.O. sampling in-situ.**
- **Environmental Systems Service, Ltd. analyze-Nitrate/Nitrite, Total P and Orthophosphate, as P.**
- **The In-House laboratory is now VELAP certified (ID # 450011)**

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **N/A**
3. Does plant appear to have sufficient equipment to perform required tests? [X] Yes [ ] No*
4. Does testing equipment appear to be clean and/or operable? [X] Yes [ ] No*

Comments: **UV disinfection is utilized at the plant**

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)
   [ ] Yes [ ] No [X] NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
   [ ] Yes [ ] No [X] NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
   [ ] Yes [ ] No* [X] NA

Comments:

None

UNIT PROCESS: Sewage Pumping

1. Name of station: **Influent Pump Station (Raw Pump Station #1)**

2. Location (if not at STP): **At STP, adjacent to plant entrance**

3. Following equipment operable:

a. all pumps	[X] Yes	[ ] No*	
b. ventilation	[X] Yes	[ ] No*	
c. control system	[X] Yes	[ ] No*	
d. sump pump	[X] Yes	[ ] No*	
e. seal water system	[X] Yes	[ ] No*	

4. Reliability considerations:

a. Class	[X] I	[ ] II	[ ] III
b. Alarm system operable:	[X] Yes	[ ] No*	
c. Alarm conditions monitored:			
1. high water level	[X] Yes	[ ] No*	
2. high liquid level in dry well	[X] Yes	[ ] No	[ ] NA
3. main electric power	[X] Yes	[ ] No	[ ] NA
4. auxiliary electric power	[ ] Yes	[ ] No	[X] NA
5. failure of pump motors to start	[X] Yes	[ ] No	[ ] NA
6. test function	[X] Yes	[ ] No*	
7. other	[ ] Yes	[ ] No	
d. Backup for alarm system operational:	[X] Yes	[ ] No	[ ] NA

e. Alarm signal reported to (identify): **SCADA - control room/plant office**

f. Continuous operability provisions:

[X] generator **(one back-up)**	[ ] two sources of power	
[ ] portable pump	[ ] 1 day storage	[ ] other

5. Does station have bypass: [ ] Yes* [X] No

a. evidence of bypass use	[ ] Yes*	[ ] No
b. can bypass be disinfected	[ ] Yes	[ ] No
c. can bypass be measured	[ ] Yes	[ ] No

6. How often is station checked? **Once per shift**

7. General condition: [ ] Good [X] Fair [ ] Poor

Comments:

- **Influent flow meter displayed 2.9 MGD.**
- **There are a total of 4 pumps, which are each turned on and tested daily (12 MGD capacity)**
- **There is a leak occurring where the influent pipe leaves the building (same leak noted during technical inspections conducted December 14, 2006 and February 25, 2011). Mr. Hust says it is most likely groundwater making its way through. The leak did not have a sewage appearance or odor. The pipe appears rusted and the staining from the pipe is continuing down the wall (photos 2 &3)**
- **An alarm light was flashing at one of the panels Mr. Hust stated that it is for electrical metering and will be fixed.**

UNIT PROCESS: Sewage Pumping

1. Name of station: **McDevitt Pump Station (Raw Pump Station #2)**

2. Location (if not at STP): **at STP**

3. Following equipment operable:

a. all pumps	[X] Yes	[ ] No*	
b. ventilation	[X] Yes	[ ] No*	
c. control system	[X] Yes	[ ] No*	
d. sump pump	[ ] Yes	[ ] No*	[X] N/A
e. seal water system	[X] Yes	[ ] No*	

4. Reliability considerations:

a. Class	[X] I	[ ] II	[ ] III
b. Alarm system operable:	[X] Yes	[ ] No*	
c. Alarm conditions monitored:			
1. high water level	[X] Yes	[ ] No*	
2. high liquid level in dry well	[ ] Yes	[ ] No	[X] NA
3. main electric power	[X] Yes	[ ] No	[ ] NA
4. auxiliary electric power	[X] Yes	[ ] No	[ ] NA
5. failure of pump motors to start	[X] Yes	[ ] No	[ ] NA
6. test function	[X] Yes	[ ] No*	
7. other	[ ] Yes	[ ] No	
d. Backup for alarm system operational:	[X] Yes	[ ] No	[ ] NA
e. Alarm signal reported to (identify):	**SCADA/Control Room**		
f. Continuous operability provisions:			
[X] generator	[ ] two sources of		
[ ] portable pump	[ ] 1 day storage		[ ] other

5. Does station have bypass:	[ ] Yes*	[X] No	
a. evidence of bypass use	[ ] Yes*	[ ] No	[X] N/A
b. can bypass be disinfected	[ ] Yes	[ ] No	[X] N/A
c. can bypass be measured	[ ] Yes	[ ] No	[X] N/A

6. How often is station checked? **Once per shift**

7. General condition:	[X] Good	[ ] Fair	[ ] Poor

Comments:

- **2 pumps total, 4 MGD capacity**

UNIT PROCESS: Screening/Comminution

1. Number of Units: **2** Manual: **0** Mechanical: **2**

   Number in operation: **2** Manual: **0** Mechanical: **2**

2. Bypass channel provided: [**X**] Yes [ ] No*
   Bypass channel in use: [ ] Yes [**X**] No

3. Area adequately ventilated: [**X**] Yes [ ] No*

4. Alarm system for equipment failure or overloads: [**X**] Yes [ ] No*

5. Proper flow distribution between units: [**X**] Yes [ ] No [ ] NA

6. How often are units checked and cleaned? **Once per shift**

7. Cycle of operation: **Continuous**

8. Volume of screenings removed: **Clean dumpster twice per week**

9. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **Both mechanical fine screens (one 6 MGD screen and one 12 MGD screen) were working OK.**
- **Mr. Hust stated that the automatic brushes are replaced approximately every 6 months, when they wear out.**

UNIT PROCESS: Grit Removal

1. Number of units: **1** In operation: **1**

2. Unit adequately ventilated: [**X**] Yes [ ] No*

3. Operation of grit collection equipment: [ ] Manual [ ] Time clock [**X**] Continuous duty

4. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

5. Daily volume of grit removed: **Clean dumpster twice per week**

6. All equipment operable: [**X**] Yes [ ] No*

7. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **After flowing through the vortex grit removal chamber, the classifier dewaters and funnels the grit into the dumpster. The remaining flow is split between 2 parshall flumes, each going to a separate primary clarifier.**
- **Culpeper WWTP is planning on getting 2 new grit pumps in the future**

UNIT PROCESS: Sedimentation

[X] Primary [ ] Secondary [ ] Tertiary

1. Number of units: **2**	In operation: **2**			
2. Proper flow distribution between units:		[X] Yes	[ ] No*	[ ] NA
3. Signs of short circuiting and/or overloads:		[ ] Yes	[X] No	
4. Effluent weirs level: Clean:		[X] Yes [ ] Yes	[ ] No* [X] No*	
5. Scum collection system working properly:		[X] Yes	[ ] No*	[ ] NA
6. Sludge collection system working properly:		[X] Yes	[ ] No*	
7. Influent, effluent baffle systems working properly:		[X] Yes	[ ] No*	
8. Chemical addition: Chemicals:		[ ] Yes	[X] No	
9. Effluent characteristics:	**Some algae, floating solids, and floating plastics**			
10. General condition:		[ ] Good	[X] Fair	[ ] Poor

Comments:

- **There were floating solids and some plastics in the clarifier in addition to algae growth on the weirs. There was a burrowing animal hole going directly under clarifier #1 (photos 4, 5, & 6).**
- **The scum is drained once per week and goes into the anaerobic digesters.**

UNIT PROCESS: Sewage Pumping

1. Name of station: **EQ Pump Station**

2. Location (if not at STP):

3. Following equipment operable:

a. all pumps	[X] Yes	[ ] No*	
b. ventilation	[X] Yes	[ ] No*	
c. control system	[X] Yes	[ ] No*	
d. sump pump	[ ] Yes	[ ] No*	
e. seal water system	[X] Yes	[ ] No*	

4. Reliability considerations:

a. Class	[X] I	[ ] II	[ ] III
b. Alarm system operable:	[X] Yes	[ ] No*	
c. Alarm conditions monitored:			
1. high water level	[X] Yes	[ ] No*	
2. high liquid level in dry well	[ ] Yes	[ ] No	[X] NA
3. main electric power	[X] Yes	[ ] No	[ ] NA
4. auxiliary electric power	[X] Yes	[ ] No	[ ] NA
5. failure of pump motors to start	[X] Yes	[ ] No	[ ] NA
6. test function	[X] Yes	[ ] No*	
7. other	[X] Yes	[ ] No	
d. Backup for alarm system operational:	[X] Yes	[ ] No	[ ] NA
e. Alarm signal reported to (identify):	**SCADA/Control Room**		
f. Continuous operability provisions:			
[X] generator	[ ] two sources of		
[ ] portable pump	[ ] 1 day storage		[ ] other

5. Does station have bypass:	[ ] Yes*	[X] No	
a. evidence of bypass use	[ ] Yes*	[ ] No	
b. can bypass be disinfected	[ ] Yes	[ ] No	
c. can bypass be measured	[ ] Yes	[ ] No	
6. How often is station checked?	**Once per shift**		
7. General condition:	[X] Good	[ ] Fair	[ ] Poor

Comments:

- **This pump station sends primary influent to the EQ basin during high flows.**
- **The control room is temperature controlled**
- **No problems observed**

UNIT PROCESS: Ponds/Lagoons

1. Type:		[ ] Aerated	[X] Unaerated	[ ] Polishing	
2. No. of cells:		**1**	In operation:	**0**	
3. Color:	[ ] Green	[ ] Brown	[ ] L. Brown	[ ] Grey	[X] Other: **Lagoon is empty**
4. Odor:	[ ] Septic*	[ ] Earthy	[X] None	[ ] Other:	
5. System operated in:		[ ] Series	[ ] Parallel	[X] NA	
6. If aerated, are lagoon contents mixed adequately?			[ ] Yes	[ ] No*	[X] NA
7. If aerated, is aeration system operating properly?			[ ] Yes	[ ] No*	[X] NA
8. Evidence of following problems:					
a. vegetation in lagoon or dikes			[ ] Yes*	[X] No	
b. rodents burrowing on dikes			[ ] Yes*	[X] No	
c. erosion			[ ] Yes*	[X] No	
d. sludge bars			[ ] Yes*	[X] No	
e. excessive foam			[ ] Yes*	[X] No	
f. floating material			[ ] Yes*	[X] No	
9. Fencing intact:			[X] Yes	[ ] No*	
10. Grass maintained properly:			[X] Yes	[ ] No	
11. Level control valves working properly:			[ ] Yes	[ ] No*	
12. Effluent discharge elevation:		[ ] Top	[ ] Middle	[X] Bottom	
13. Freeboard:		**NA**			
14. Appearance of effluent:		[ ] Good	[ ] Fair	[ ] Poor	[X] N/A
15. General condition:			[X] Good	[ ] Fair	[ ] Poor
16. Are monitoring wells present?			[X] Yes	[ ] No	
Are wells adequately protected from runoff?			[X] Yes	[ ] No*	[ ] NA
Are caps on and secured?			[X] Yes	[ ] No*	[ ] NA

Comments:

- **The lagoon has a capacity of 9 million gallons and is currently empty.**
- **It is utilized as necessary depending on rain events, but not often.**
- **Its high level alarm is at 14.5 feet.**
- **No problems observed.**

UNIT PROCESS: Activated Sludge Aeration

1. Number of units: **2** In operation: **1**

2. Mode of operation: **Biological Nutrient Removal - 5 zones consisting of anoxic and aerobic regions**

3. Proper flow distribution between units:	[ ] Yes	[ ] No*	[X] NA
4. Foam control operational:	[ ] Yes	[ ] No*	[X] NA
5. Scum control operational:	[ ] Yes	[ ] No*	[X] NA
6. Evidence of following problems:			
a. dead spots	[ ] Yes*	[X] No	
b. excessive foam	[ ] Yes*	[X] No	
c. poor aeration	[ ] Yes*	[X] No	
d. excessive aeration	[ ] Yes*	[X] No	
e. excessive scum	[ ] Yes*	[X] No	
f. aeration equipment malfunction	[ ] Yes*	[X] No	
g. other (identify in comments)	[ ] Yes*	[X] No	

7. Mixed liquor characteristics (as available): **September 2014 - BNR-C**

MLSS:	**3812 mg/L**
SDI/SVI:	**58**
Color:	**Brown**
Odor:	**None**
Settleability:	**22%**
MLVSS:	**2772 mg/L**

8. Return/waste sludge:
   A. Return Rate: **73%** b. Waste Rate: **25,719 GPD** c. Frequency of Wasting: **Daily**

9. Aeration system control: [ ] Time Clock [ ] Manual [X] Continuous [ ] Other (explain)

10. Effluent control devices working properly (oxidation ditches): [ ] Yes [ ] No* [X] NA

11. General condition: [X] Good [Fair [ ] Poor

Comments:

- **The D.O is checked daily with the D.O probe in all four zones. Additionally, the aerobic zone has a fixed D.O analyzer that has a set point of 2.0 mg/L. The D.O was measured at 3.01 mg/L at the inspection.**
- **BNR #1 was cleaned out last spring in addition to undergoing an inspection and maintainence - 75 diffusers were replaced at that time.**
- **There are a total of three variable speed blowers that have the ability to provide air to the basin. Only 1 blower typically is in use at a time (no more than 2 blowers are running at a time).**
- **Approximately 200 GPD of micro-C is added to the BNR tank**
- **The 2 old aeration basins are not in use**

UNIT PROCESS: Sedimentation

[ ] Primary [X] Secondary [ ] Tertiary

1. Number of units: **4**	In operation:	**2**		
2. Proper flow distribution between units:		[X] Yes	[ ] No*	[ ] NA
3. Signs of short circuiting and/or overloads:		[ ] Yes	[X] No	
4. Effluent weirs level: Clean: **Some algae/floating plastic debris**		[X] Yes [ ] Yes	[ ] No* [X] No*	
5. Scum collection system working properly:		[X] Yes	[ ] No*	[ ] NA
6. Sludge collection system working properly:		[X] Yes	[ ] No*	
7. Influent, effluent baffle systems working properly:		[X] Yes	[ ] No*	
8. Chemical addition: Chemicals:		[ ] Yes **N/A**	[X] No	
9. Effluent characteristics:		**Clear**		
10. General condition:		[ ] Good	[X] Fair	[ ] Poor

Comments:

- **There are two old secondary clarifiers that are not currently in use. However, they are plumbed and can be used if need be.**
- **The weirs on the secondary clarifiers were in need of cleaning - this is a repeat issue in previous inspection reports.**
- **The scum from the skimmer is pumped down and sent to the digesters. The sludge blanket is kept below 2'.**
- **The WAS is sent to the gravity belt thickener and the effluent from the clarifier flows to the intermediate pump station**

UNIT PROCESS: Sewage Pumping

1. Name of station: **Intermediate Pump Station**

2. Location (if not at STP):

3. Following equipment operable:

a. all pumps	[X] Yes	[ ] No*	
b. ventilation	[X] Yes	[ ] No*	
c. control system	[X] Yes	[ ] No*	
d. sump pump	[ ] Yes	[ ] No*	[X] N/A
e. seal water system	[ ] Yes	[ ] No*	[X] N/A

4. Reliability considerations:

a. Class	[X] I	[ ] II	[ ] III
b. Alarm system operable:	[X] Yes	[ ] No*	
c. Alarm conditions monitored:			
1. high water level	[X] Yes	[ ] No*	
2. high liquid level in dry well	[ ] Yes	[X] No	[ ] NA
3. main electric power	[X] Yes	[ ] No	[ ] NA
4. auxiliary electric power	[X] Yes	[ ] No	[ ] NA
5. failure of pump motors to start	[X] Yes	[ ] No	[ ] NA
6. test function	[X] Yes	[ ] No*	
7. other	[ ] Yes	[ ] No	
d. Backup for alarm system operational:	[ ] Yes	[ ] No	[X] NA

e.Alarm signal reported to (identify):**SCADA/Control Room**

f. Continuous operability provisions:

[X] generator	[ ] two sources of	
[ ] portable pump	[ ] 1 day storage	[ ] other

5. Does station have bypass: [ ] Yes* [X] No

a. evidence of bypass use	[ ] Yes*	[ ] No
b. can bypass be disinfected	[ ] Yes	[ ] No
c. can bypass be measured	[ ] Yes	[ ] No

6. How often is station checked? **Once per shift**

7. General condition: [X] Good [ ] Fair [ ] Poor

Comments:

- **In the control room, the SCADA system indicated that all four pumps were disabled. After investigation, Mr. Hust discovered that the power cord to the alarm system had been tripped over and unplugged. The pumps were never actually disabled and the SCADA was fixed prior to DEQ's departure.**

- **There are four pumps total, which send the clarifier effluent to the flash mix tank.**

UNIT PROCESS: Sedimentation

[ ] Primary [ ] Secondary [X] Tertiary

1. Number of units: **2**	In operation: **2**			
2. Proper flow distribution between units:		[X] Yes	[ ] No*	[ ] NA
3. Signs of short circuiting and/or overloads:		[ ] Yes	[X] No	
4. Effluent weirs level:		[ ] Yes	[ ] No*	[X] NA
Clean:		[ ] Yes	[ ] No*	[X] NA
5. Scum collection system working properly:		[X] Yes	[ ] No*	[ ] NA
6. Sludge collection system working properly:		[X] Yes	[ ] No*	
7. Influent, effluent baffle systems working properly:		[X] Yes	[ ] No*	
8. Chemical addition: Chemicals:	**Alum**	[X] Yes	[ ] No	
9. Effluent characteristics:	**Clear**			
10. General condition:		[X] Good	[ ] Fair	[ ] Poor

Comments:

- **Approximately 130 gallons/day are added at the basins for phosphorus removal**
- **No problems observed.**

UNIT PROCESS: Filtration

1. Type of filters:	[X] Gravity	[ ] Pressure	[ ] Intermittent	
2. Number of units:	**6**	In operation:	**6**	
3. Operation of system:	[X] Automatic	[ ] Semi-automatic	[ ] Manual	[ ] Other (specify)
4. Proper flow distribution between units:		[X] Yes	[ ] No*	[ ] NA
5. Evidence of following problems:				
a. uneven flow distribution		[ ] Yes*	[X] No	
b. filter clogging (ponding)		[ ] Yes*	[X] No	
c. nozzles clogging		[ ] Yes*	[X] No	
d. icing		[ ] Yes*	[X] No	
e. filter flies		[ ] Yes*	[X] No	
f. vegetation on filter		[ ] Yes*	[X] No	
6. Filter aid system provided:		[ ] Yes	[X] No	
Properly operating:		[ ] Yes	[ ] No	[X] NA
Chemical used:		**N/A**		
7. Automatic valves properly operating:		[ ] Yes*	[ ] No*	[X] NA
8. Valves sequencing correctly:		[ ] Yes*	[ ] No*	[X] NA
9. Backwash system operating properly:		[X] Yes*	[ ] No*	[ ] NA
10. Filter building adequately ventilated:		[X] Yes*	[ ] No*	[ ] NA
11. Effluent characteristics:		**Not observed**		
12. General condition:		[X] Good	[ ] Fair	[ ] Poor

Comments:

- **There are currently 6 single-media deep bed filters, which are currently operating for total suspended solids removal only. They have the ability to operate as de-nitrification filters with the addition of methanol to the filter influent channel.**
- **3 filters are backwashed per day manually, which means that all filters are backwashed within a 48 hour time period. The filter backwash is pumped to lagoon #1, which is an 11 foot deep concrete lagoon.**
- **The "bumping" function of the filters is disabled. The filters are not used for denitrification, so this function, which allows for the removal of built of N in the filter media, is disabled at this time.**
- **No problems observed.**

UNIT PROCESS: Ponds/Lagoons

1. Type: [ ] Aerated [X] Unaerated [ ] Polishing
2. No. of cells: **3** In operation: **2**
3. Color: [ ] Green [X] Brown [ ] L. Brown [ ] Grey [ ] Other:
4. Odor: [ ] Septic* [ ] Earthy [X] None [ ] Other:
5. System operated in: [ ] Series [ ] Parallel [X] NA
6. If aerated, are lagoon contents mixed adequately? [ ] Yes [ ] No* [X] NA
7. If aerated, is aeration system operating properly? [ ] Yes [ ] No* [X] NA
8. Evidence of following problems:

a. vegetation in lagoon or dikes	[X] Yes*	[ ] No
b. rodents burrowing on dikes	[ ] Yes*	[X] No
c. erosion	[ ] Yes*	[X] No
d. sludge bars	[ ] Yes*	[X] No
e. excessive foam	[ ] Yes*	[X] No
f. floating material	[ ] Yes*	[X] No

9. Fencing intact: [X] Yes [ ] No*
10. Grass maintained properly: [X] Yes [ ] No
11. Level control valves working properly: [ ] Yes [ ] No* [X] **Not observed**
12. Effluent discharge elevation: [ ] Top [ ] Middle [X] Bottom
13. Freeboard: **Lagoon #1 has a high alarm at 14.5 ft, lagoon #2 and #3 have a 7 ft free board.**
14. Appearance of effluent: [ ] Good [ ] Fair [ ] Poor [X] **Not observed**
15. General condition: [X] Good [ ] Fair [ ] Poor
16. Are monitoring wells present? [X] Yes [ ] No

    Are wells adequately protected from runoff? [X] Yes [ ] No* [ ] NA

    Are caps on and secured? [X] Yes [ ] No* [ ] NA

Comments:

- **Duckweed and some vegetation was observed in cell #1**
- **Lagoon #1 is concrete lined and is utilized daily for filter backwash**
- **Holding lagoons #2 and #3 can receive overflow from lagoon #1, but very rarely receives it. These two lagoons are clay lined and can hold a capacity of 2 million gallons.**

UNIT PROCESS: Ultraviolet (UV) Disinfection

1. Number of UV lamps/assemblies: **3**	In operation: **1**			
2. Type of UV system and design dosage: **Trojan UV 3000+**				
3. Proper flow distribution between units:		[ ] Yes	[ ] No*	[X] NA
4. Method of UV intensity monitoring: **Intensity meters- UVI 95.2%**				
5. Adequate ventilation of ballast control boxes:		[X] Yes	[ ] No*	[ ] NA
6. Indication of on/off status of all lamps provided:		[X] Yes	[ ] No*	
7. Lamp assemblies easily removed for maintenance:		[X] Yes	[ ] No*	
8. Records of lamp operating hours and replacement dates provided:		[X] Yes	[ ] No*	
9. Routine cleaning system provided:		[X] Yes	[ ] No*	
Operate properly:		[X] Yes	[ ] No*	
Frequency of routine cleaning:		**Automatically with auto-wipers**		
10. Lamp energy control system operate properly:		[X] Yes	[ ] No*	
11. Date of last system overhaul:		**Quarterly**		
a. UV unit completely drained		[X] Yes	[ ] No*	
b. all surfaces cleaned		[X] Yes	[ ] No*	
c. UV transmissibility checked		[X] Yes	[ ] No*	
d. output of selected lamps checked		[X] Yes	[ ] No*	
e. output of tested lamps		**85.6 UVT**		
f. total operating hours, oldest lamp/assembly		**14,261**		
g. number of spare lamps and ballasts available:	lamps: **unknown**	ballasts: **unknown**		
12. UV protective eyeglasses provided:		[X] Yes	[ ] No*	
13. General condition:		[X] Good	[ ] Fair	[ ] Poor

Comments:

- **There are a total of three channels, six banks per channel, and eight bulbs per bank - only one channel is in operation at a time. Each channel has 48 lamps total.**
- **Maintenance is done quarterly by staff which includes inspecting and replacing bulbs on an as-needed basis. The bulbs in each channel are replaced annually.**
- **The following UV parameters were displayed - 67.59 mWs/cm^2 dose at 2.460 MGD flow and 85.6 UVT. The intensity setting was set at 60%. In order to maintain disinfection, the O&M manual states that the dosage be >30mW/cm^2. Existing dosage is OK.**
- **The Hach SC100 display screen, which showed the transmittance value, was very hard to read. DEQ highly recommends fixing or replacing the display screen.**

UNIT PROCESS: Flow Measurement

[ ] Influent [ ] Intermediate [X] Effluent

1. Type measuring device: **Rectangular weir with ultrasonic transducer**

2. Present reading: **2.460 MG**

3. Bypass channel:	[ ] Yes	[X] No	
Metered:	[ ] Yes	[ ] No	[X] N/A
4. Return flows discharged upstream from meter: Identify:	[ ] Yes	[X] No	
5. Device operating properly:	[X] Yes	[ ] No*	
6. Date of last calibration: **January 7, 2014**			
7. Evidence of following problems:			
a. obstructions	[ ] Yes*	[X] No	
b. grease	[ ] Yes*	[X] No	
8. General condition:	[X] Good	[ ] Fair	[ ] Poor

Comments:

None

UNIT PROCESS: Post Aeration

1. Number of units: **1**		In operation: **1**			
2. Proper flow distribution between units:		[ ] Yes	[ ] No*	[X] NA	
3. Evidence of following problems:					
a. dead spots		[ ] Yes*	[X] No		
b. excessive foam		[ ] Yes*	[X] No		
c. poor aeration		[ ] Yes*	[X] No		
d. mechanical equipment failure		[ ] Yes*	[X] No	[ ] NA	
4. How is the aerator controlled?	[ ] Time clock	[ ] Manual	[X] Continuous	[ ] Other:	[ ] NA
5. What is the current operating schedule? **Continuous**					
6. Step weirs level:		[X] Yes	[ ] No	[ ] NA	
7. Effluent D.O. level:	**D.O. measured in-situ by Sharon Allen @ 1415 : 9.36 mg/L @ 20.1°C**				
8. General condition:		[X] Good	[ ] Fair	[ ] Poor	

Comments:

- **No problems observed**

UNIT PROCESS: Effluent/Plant Outfall

1. Type Outfall: [X] Shore based [ ] Submerged
2. Type if shore based: [ ] Wingwall [X] Headwall [ ] Rip Rap
3. Flapper valve: [ ] Yes [X] No [ ] NA
4. Erosion of bank: [ ] Yes [X] No [ ] NA
5. Effluent plume visible? [ ] Yes* [X] No
6. Condition of outfall and supporting structures: [X] Good [ ] Fair [ ] Poor*
7. Final effluent, evidence of following problems:

a. oil sheen	[ ] Yes*	[X] No
b. grease	[ ] Yes*	[X] No
c. sludge bar	[ ] Yes*	[X] No
d. turbid effluent	[ ] Yes*	[X] No
e. visible foam	[ ] Yes*	[X] No
f. unusual color	[ ] Yes*	[X] No

Comments:

- **Final effluent was clear and odorless - no problems observed.**

UNIT PROCESS: Sludge Pumping

1. Number of Pumps: **3** In operation: **2**

2. Type of sludge pumped: [ ] Primary [ ] Secondary [X] Return Activated
   [ ] Combination [ ] Other:

3. Type of pump: [ ] Plunger [ ] Diaphragm [ ] Screwlift [X] Centrifugal
   [ ] Progressing Cavity [ ] Other:

4. Mode of operation: [ ] Manual [X] Automatic [ ] Other(explain):

5. Sludge volume pumped: **Approximately 1.6 GPM (Average for October 2014)**

6. Alarm system for equipment failures or overloads operational: [X] Yes [ ] No [ ] NA

7. General condition: [ ] Good [X] Fair [ ] Poor

Comments:

- **Three total pumps, two are on continuously and one is utilized as a backup. They are rotated.**

UNIT PROCESS: Sludge Pumping

1. Number of Pumps: **2** In operation: **1**

2. Type of sludge pumped: [ ] Primary [X] Secondary [ ] Return Activated
   [ ] Combination [ ] Other:

3. Type of pump: [ ] Plunger [ ] Diaphragm [ ] Screwlift [X] Centrifugal
   [ ] Progressing cavity [ ] Other:

4. Mode of operation: [ ] Manual [X] Automatic [ ] Other(explain):

5. Sludge volume pumped: **approximately 20,000 gals/day**

6. Alarm system for equipment failures or overloads operational: [X] Yes [ ] No [ ] NA

7. General condition: [X] Good [ ] Fair [ ] Poor

Comments:

- **1 pump operated at a time, pumps are rotated.**

UNIT PROCESS: Pressure Filtration (Sludge) Gravity Belt Thickener

1. Number of units: **2** In operation: **1**
2. Percent solids in influent sludge: **~1%**
3. Percent solids in discharge cake: **~ 5%**
4. Filter run time: **4 hrs/day**
5. Amount cake produced: **2.29 average per day Dry Tons (October 2014)**
6. Conditioning chemicals used: **Polymer**
   Dose: **10:1 ratio**
7. Sludge pumping: [ ] Manual [**X**] Automatic
8. Recirculating system included on acid wash: [ ] Yes [ ] No [**X**] NA
9. Signs of overloads: [ ] Yes* [**X**] No
10. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

None

UNIT PROCESS: Anaerobic Digestion

1. Number of units: **2**		In operation: **2**		
2. Type of sludge digested:	**Thickened WAS and septage**			
3. Type of digester:	[ ] Primary	[ ] High rate	[X] Secondary	[ ] Standard rate
4. Frequency of sludge application to digestors: **30,000 gpd (WAS and septage)**				
5. Number of recirculation pumps:	**2**		In operation:	**1**
6. Sludge retention time:	**26 days (October 2014)**			
7. Provisions for pH adjustment:		[X] Yes	[ ] No	
Utilized:		[ ] Yes	[X] No	[ ] NA
8. Location of supernatant return in the plant:		[ ] Head	[ ] Primary	[X] Other(specify):**N/A**
Supernatant return rate:	**N/A (None drawn off)**			
9. Gas production rate: **Used to fuel boiler**				
10. Process control testing:	**October 2014**			
a. reduction of volatile solids:		[X] Yes	[ ] No	**34.2%**
b. volatile acids:		[ ] Yes	[X] No	
c. alkalinity:		[X] Yes	[ ] No	**1860 mg/L**
11. Signs of overloading:		[ ] Yes*	[X] No	
12. General condition:		[X] Good	[ ] Fair	[ ] Poor

Comments:

- **Approximately 3,000 cubic feet of methane is burned daily in the boilers. The digester is heated from the boiler.**
- **No problems observed.**

UNIT PROCESS: Centrifugation

1. Number of units: **2**		In operation: **1**	
2. Purpose of centrifuges:	[ ] Thickening	[X] Dewatering	[ ] Other
3. Operation of equipment:	[X] Manual	[ ] Automatic	[ ] Other
4. Centrifuge run time:	**Run 8 hours/day. It is run more frequently in the summer**		
5. Volume of influent sludge flow:	**21,959 gal/min (October 2014)**		
6. Amount cake produced:	**2.29 average per day Dry Tons (October 2014)**		
7. Sludge solids:	Effluent: **22%**		
8. Conditioning chemical fed:	**Polymer**	Dose: **Variable**	
9. Centrate return location:	**Drains to BNR influent**		
Signs of problems:	[ ] Yes*	[X] No	
10. General condition:	[X] Good	[ ] Fair	[ ] Poor

Comments:

- **1 centrifuge was down for repair**
- **Dewatered sludge is stored under cover for Recyc to pick up for biosolids land application**

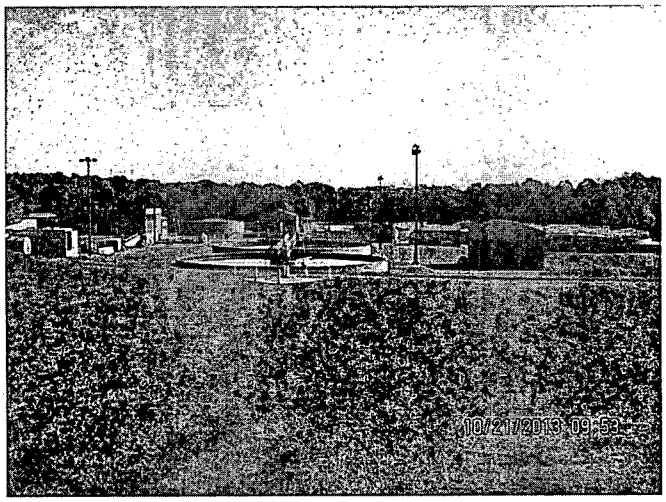


Photo 1: Overview of WWTP

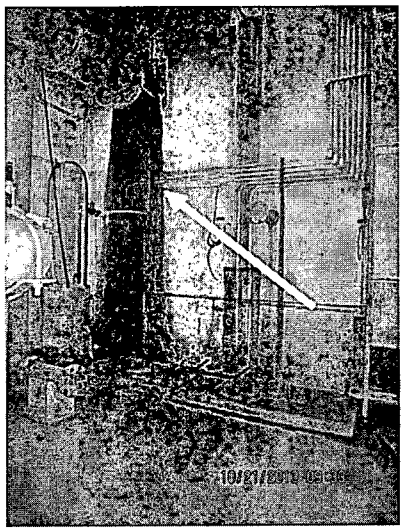


Photo 2: Influent pipe at influent pump station

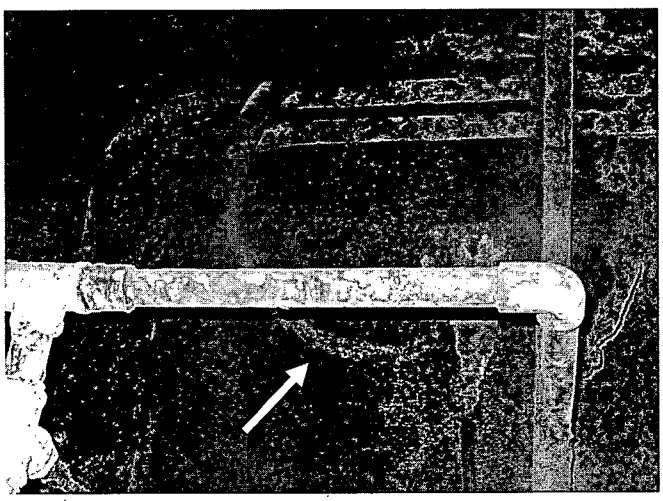


Photo 3: Dripping water -influent pipe (photo cropped)

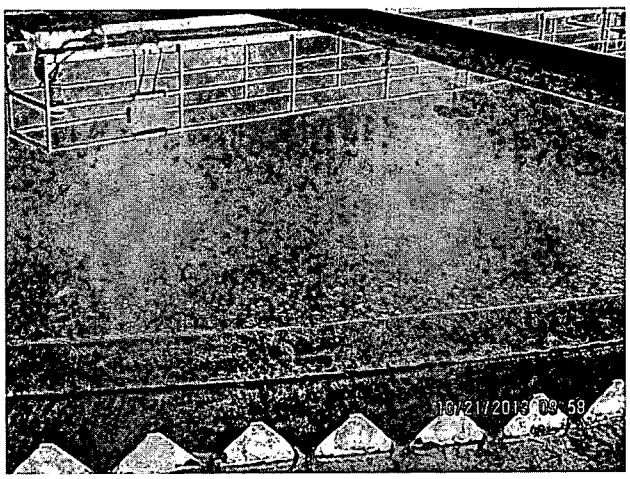


Photo 4: Primary Clarifier - algae/floating solids

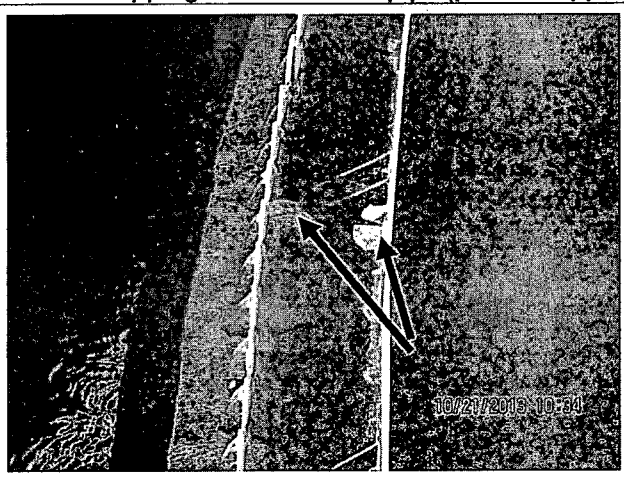


Photo 5: Plastics/debris in primary clarifier weirs

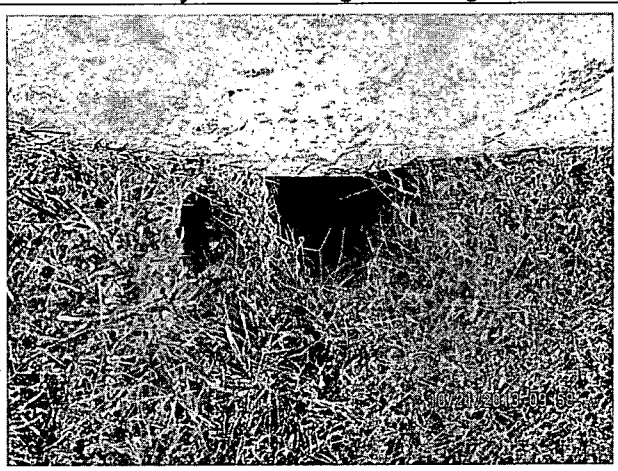


Photo 6: Burrowing animal hole-underneath primary clarifier

Photos By: Amy Dooley	Permit # VA0061590
Layout By: Lisa Janovsky	Date Taken:10/21/2014

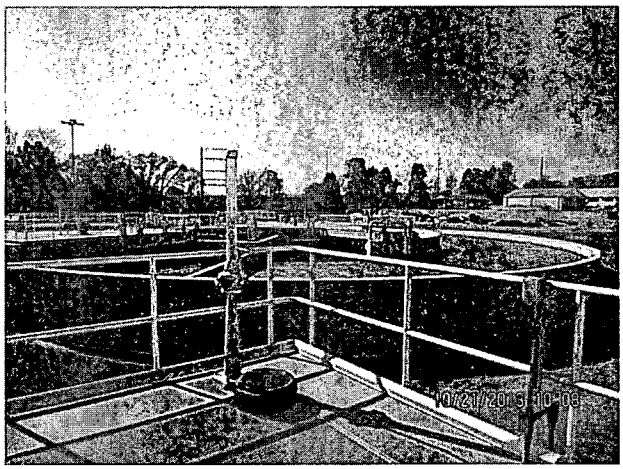


Photo 7: BNR Tank

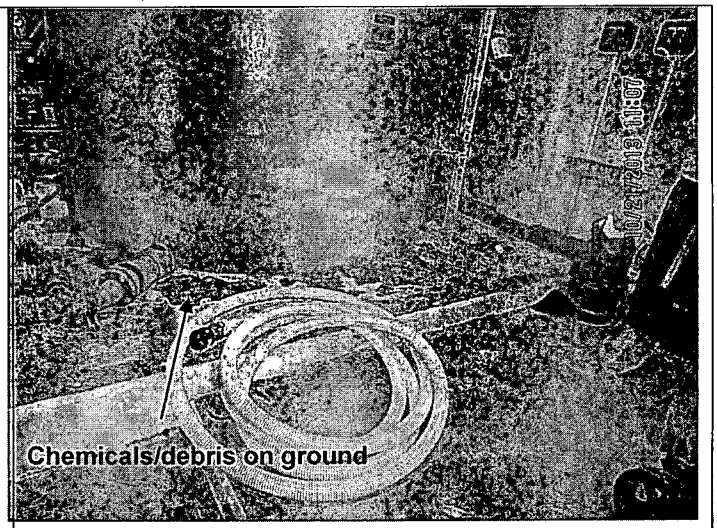


Photo 8: Poor housekeeping

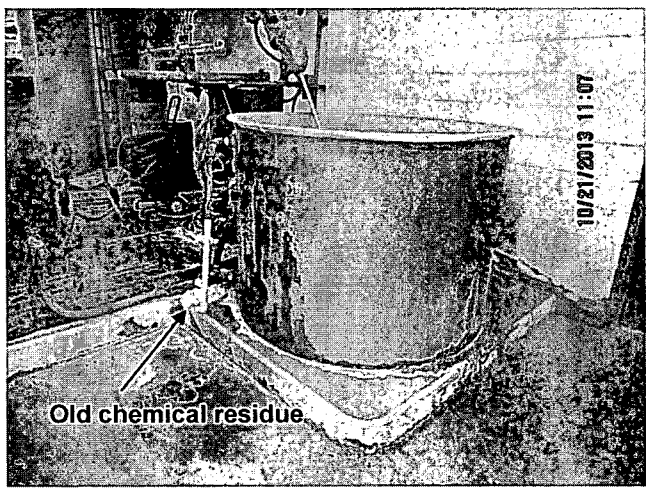


Photo 9: Old polymer mixer

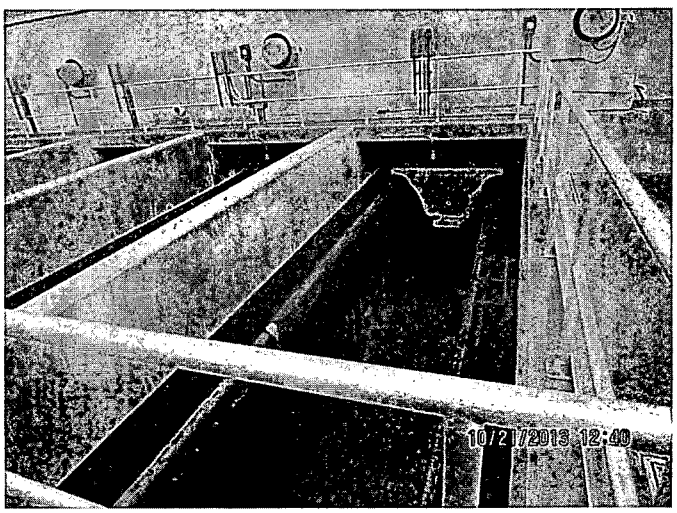


Photo 10: Filter

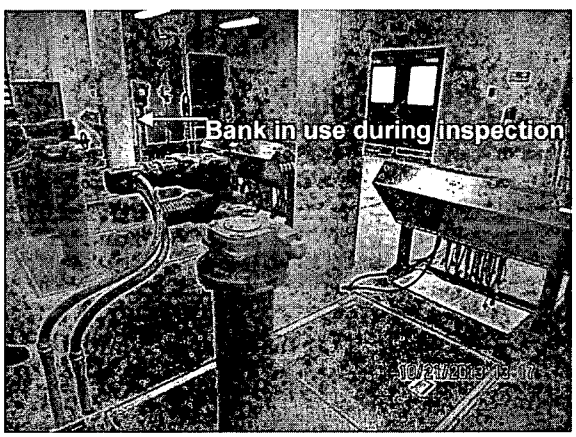


Photo 11: UV disinfection

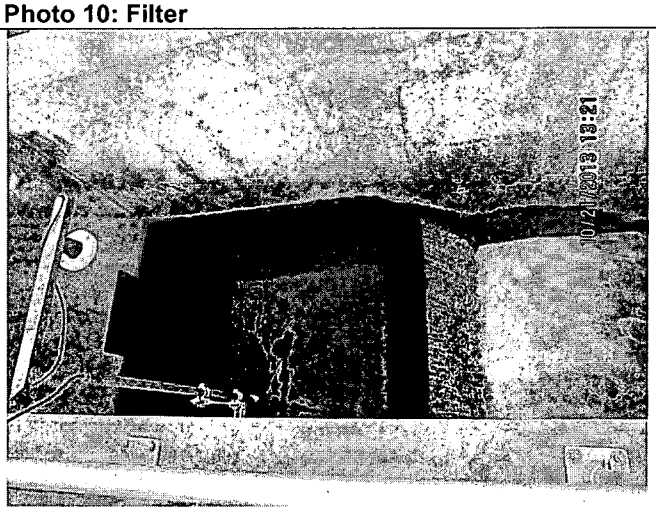


Photo 12: Post Aeration

Photos By: Amy Dooley

Layout by: Lisa Janovsky

Permit # VA0061590

Date: October 21, 2014

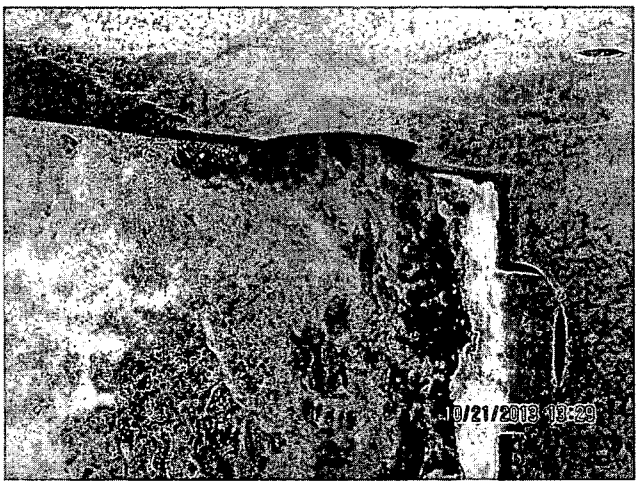


Photo 13: Effluent after post-aeration	**Photo 14: Outfall 001**

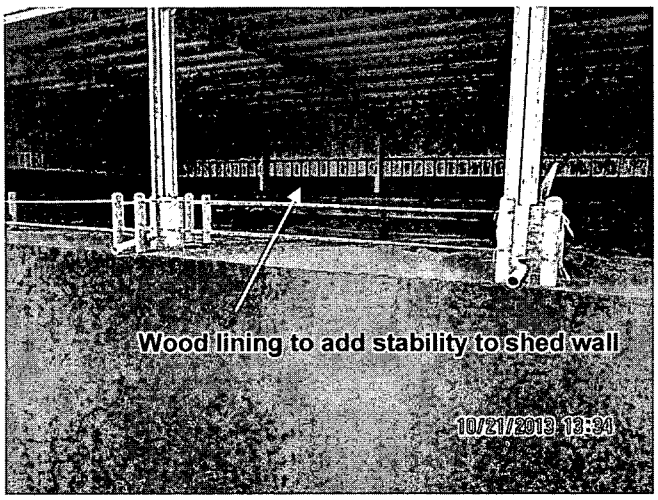
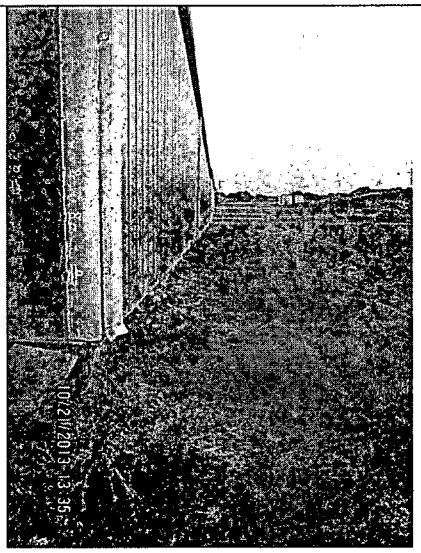

	

Photo 15: Sludge storage area demonstrating wood lining to contain sludge	**Photo 16: Sludge storage shed stability improvements.**
Photos By	**Amy Dooley**
Layout By	**Lisa Janovsky**
Permit #	**VA0061590**
Date	**October 21, 2014**

ATTACHMENT 5

To:	Alison Thompson
From:	Rebecca Shoemaker
Date:	May 13, 2015
Subject:	Planning Statement for Town of Culpeper WPCF
Permit Number:	VA0061590

Information for Outfall 001:

Discharge Type:	Municipal
Discharge Flow:	6.0 MGD
Receiving Stream:	Mountain Run
Latitude / Longitude:	38° 27' 56" N, 77° 58' 08" W
Rivermile:	19.86
Streamcode:	3-MTN
Waterbody:	VAN-E09R
Water Quality Standards:	Class III, Section 4, No special standards
Drainage Area:	12.3 sq mi

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility's outfall is located on Mountain Run. DEQ fish tissue/sediment station 3-MTN022.21 is located approximately 1.9 miles upstream from Outfall 001 and DEQ ambient monitoring station 3-MTN022.49 is located approximately 2.9 miles upstream from Outfall 001. The following is the water quality summary for this segment of Mountain Run, as taken from the 2012 Integrated Report:

   Class III, Section 4.

   DEQ monitoring stations located in this segment of Mountain Run:
   - *fish tissue/sediment station 3-MTN022.21, at Fauquier Road*
   - *ambient monitoring station 3-MTN022.49, at Route 522*

   The recreation, fish consumption and wildlife uses are considered fully supporting. The aquatic life use is considered fully supporting. However, the consensus based probable effects concentration (PEC) sediment screening values for the following parameters were exceeded in sediment samples collected in 2006; total PAHs (22,800 ppb, dry weight), anthracene (845 ppb, dry weight), benz(a)anthracene (1,050 ppb, dry weight), phenanthrene (1,170 ppb, dry weight), chrysene (1,290 ppb, dry weight), naphthalene (561 ppb, dry weight), pyrene (1,520 ppb, dry weight), benzo(a)pyrene (1,450 ppb, dry weight), fluorene (536 ppb, dry weight), and fluoranthene (2,230 ppb, dry weight). These are all noted as observed effects for the aquatic life use. In addition, citizen monitoring finds a high probability of adverse conditions for biota. An observed effect will be noted.

   The nearest downstream DEQ monitoring stations are located within a segment of Mountain Run that begins approximately 0.37 mile downstream from Outfall 001. DEQ freshwater probabilistic monitoring

station 3-MTN018.83 is located approximately 1.3 miles downstream from Outfall 001 and DEQ ambient monitoring station 3-MTN014.88 is located approximately 5.5 miles downstream from Outfall 001. The following is the water quality summary for this segment of Mountain Run, as taken from the 2012 Integrated Report:

Class III, Section 4.

DEQ monitoring stations located in this segment of Mountain Run:

- *ambient monitoring station 3-MTN014.88, at Route 663 (Stevensburg Road)*
- *freshwater probabilistic monitoring station 3-MTN018.83, downstream from Route 15 / 29 Bypass*

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The aquatic life use is considered impaired, based on benthic macroinvertebrate survey results. An observed effect is noted for the aquatic life use based on one exceedance of the consensus based probable effects concentration (PEC) sediment screening values for chlordane (17.6 ppb, dry weight). The wildlife use is considered fully supporting. E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

   No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report							
Mountain Run	Recreation	*E. coli*	0.37	Mountain Run 04/27/2001	4.58E+12 cfu/year *E. coli**	55 cfu/100 ml *E. coli* --- 6.0 MGD	---
	Aquatic Life	Benthic Macroinvertebrates		No	---	---	2020
	Fish Consumption	PCBs		No	---	---	2018

*The WLA of 4.58E+12 cfu/year includes the WLA that was previously assigned to permit VA0090212 Mountain Run WWTP, which has been terminated. Consistent with the Culpeper Nutrient Allocation Agreement, the WLA was derived by adding the WLA previously applied to this permit (3.23E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 6.0 MGD) to the WLA previously applied to the terminated permit (1.35E+12 cfu/year based on 39 cfu/100 ml *E. coli* and a maximum permitted design flow of 2.5 MGD).

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

   DEQ planning staff requests this facility continue nutrient monitoring, specifically total phosphorus, nitrate, nitrite, ammonia, and TKN. Nutrient monitoring is requested of facilities that are located within a five mile distance upstream of a benthic impairment.

   Mountain Run is listed with a PCB impairment and, in support of the PCB TMDL that is scheduled for development by 2018, this facility is a candidate for low-level PCB monitoring, based upon its designation as a municipal facility. This facility conducted PCB monitoring during the last permit cycle; the PCB monitoring data will be evaluated, and source reductions through pollution minimization plans may be needed.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

   There is one drinking water intake (for the Town of Culpeper) located within a five mile radius of Outfall 001.

ATTACHMENT 6

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Culpeper WPCF Permit No.: VA0061590

Receiving Stream: Mountain Run Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	66.6 mg/L	1Q10 (Annual) =	0 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	78.4 mg/L
90% Temperature (Annual) =	25 deg C	7Q10 (Annual) =	0 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	20 deg C	30Q10 (Annual) =	0 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	20 deg C
90% Maximum pH =	7.25 SU	1Q10 (Wet season) =	1.96 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.25 SU
10% Maximum pH =	6.3 SU	30Q10 (Wet season)	5.05 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	6.3 SU
Tier Designation (1 or 2) =	1	30Q5 =	0.8 MGD			Discharge Flow =	6 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	2.85 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.1E+01	--	--	--	--	--	--	--	--	--	--	na	1.1E+01
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	3.7E+00	--	--	--	--	--	--	--	--	--	--	na	3.7E+00
Aldrin[C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	7.4E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	7.4E-04
Ammonia-N (mg/l) (Yearly)	0	2.79E+01	2.66E+00	na	--	2.79E+01	2.66E+00	na	--	--	--	--	--	--	--	--	--	2.79E+01	2.66E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	2.79E+01	3.68E+00	na	--	3.70E+01	6.77E+00	na	--	--	--	--	--	--	--	--	--	3.70E+01	6.77E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.5E+04	--	--	--	--	--	--	--	--	--	--	na	4.5E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	7.3E+02	--	--	--	--	--	--	--	--	--	--	na	7.3E+02
Arsenic	o	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene[C]	0	--	--	na	5.1E+02	--	--	na	7.5E+02	--	--	--	--	--	--	--	--	--	--	na	7.5E+02
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	3.0E-03	--	--	--	--	--	--	--	--	--	--	na	3.0E-03
Benzo (a) anthracene[C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
Benzo (b) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
Benzo (k) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
Benzo (a) pyrene[C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
Bis2-Chloroethyl Ether[C]	0	--	--	na	5.3E+00	--	--	na	7.8E+00	--	--	--	--	--	--	--	--	--	--	na	7.8E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	7.4E+04	--	--	--	--	--	--	--	--	--	--	na	7.4E+04
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	na	2.2E+01	--	--	na	3.2E+01	--	--	--	--	--	--	--	--	--	--	na	3.2E+01
Bromoform[C]	0	--	--	na	1.4E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	2.2E+03	--	--	--	--	--	--	--	--	--	--	na	2.2E+03
Cadmium	0	3.0E+00	9.4E-01	na	--	3.0E+00	9.4E-01	na	--	--	--	--	--	--	--	--	--	3.0E+00	9.4E-01	na	--
Carbon Tetrachloride[C]	0	--	--	na	1.6E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	--	--	na	2.4E+01
Chlordane[C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	1.2E-02	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	1.2E-02
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	1.9E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	4.7E+02	6.1E+01	na	--	4.7E+02	6.1E+01	na	--	--	--	--	--	--	--	--	--	4.7E+02	6.1E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene[C]	0	--	--	na	1.8E-02	--	--	na	2.7E-02	--	--	--	--	--	--	--	--	--	--	na	2.7E-02
Copper	0	1.1E+01	7.3E+00	na	--	1.1E+01	7.3E+00	na	--	--	--	--	--	--	--	--	--	1.1E+01	7.3E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.8E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	1.8E+04
DDD[C]	0	--	--	na	3.1E-03	--	--	na	4.6E-03	--	--	--	--	--	--	--	--	--	--	na	4.6E-03
DDE[C]	0	--	--	na	2.2E-03	--	--	na	3.2E-03	--	--	--	--	--	--	--	--	--	--	na	3.2E-03
DDT[C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	3.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	3.2E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene[C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	2.2E+02	--	--	--	--	--	--	--	--	--	--	na	2.2E+02
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	4.1E-01	--	--	--	--	--	--	--	--	--	--	na	4.1E-01
Dichlorobromomethane[C]	0	--	--	na	1.7E+02	--	--	na	2.5E+02	--	--	--	--	--	--	--	--	--	--	na	2.5E+02
1,2-Dichloroethane[C]	0	--	--	na	3.7E+02	--	--	na	5.5E+02	--	--	--	--	--	--	--	--	--	--	na	5.5E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	8.0E+03	--	--	--	--	--	--	--	--	--	--	na	8.0E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	3.3E+02	--	--	--	--	--	--	--	--	--	--	na	3.3E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	2.2E+02	--	--	--	--	--	--	--	--	--	--	na	2.2E+02
1,3-Dichloropropene[C]	0	--	--	na	2.1E+02	--	--	na	3.1E+02	--	--	--	--	--	--	--	--	--	--	na	3.1E+02
Dieldrin[C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	8.0E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	8.0E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	5.0E+04	--	--	--	--	--	--	--	--	--	--	na	5.0E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	9.6E+02
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.2E+06	--	--	--	--	--	--	--	--	--	--	na	1.2E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	5.1E+03	--	--	--	--	--	--	--	--	--	--	na	5.1E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	--	--	na	6.0E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	3.2E+02	--	--	--	--	--	--	--	--	--	--	na	3.2E+02
2,4-Dinitrotoluene[C]	0	--	--	na	3.4E+01	--	--	na	5.0E+01	--	--	--	--	--	--	--	--	--	--	na	5.0E+01
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.8E-08	--	--	--	--	--	--	--	--	--	--	na	5.8E-08
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	3.0E+00	--	--	--	--	--	--	--	--	--	--	na	3.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	1.0E+02	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	1.0E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	1.0E+02	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	1.0E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.0E+02	--	--	--	--	--	--	--	--	--	--	na	1.0E+02
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.8E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	6.8E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.4E-01	--	--	--	--	--	--	--	--	--	--	na	3.4E-01

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(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.4E+03	--	--	--	--	--	--	--	--	--	--	na	2.4E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	--	--	na	1.6E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	--	--	na	6.0E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	1.2E-03	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	1.2E-03
Heptachlor Epoxide [C]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	5.8E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	5.8E-04
Hexachlorobenzene [C]	0	--	--	na	2.9E-03	--	--	na	4.3E-03	--	--	--	--	--	--	--	--	--	--	na	4.3E-03
Hexachlorobutadiene [C]	0	--	--	na	1.8E+02	--	--	na	2.7E+02	--	--	--	--	--	--	--	--	--	--	na	2.7E+02
Hexachlorocyclohexane Alpha-BHC [C]	0	--	--	na	4.9E-02	--	--	na	7.2E-02	--	--	--	--	--	--	--	--	--	--	na	7.2E-02
Hexachlorocyclohexane Beta-BHC [C]	0	--	--	na	1.7E-01	--	--	na	2.5E-01	--	--	--	--	--	--	--	--	--	--	na	2.5E-01
Hexachlorocyclohexane Gamma-BHC [C] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	2.7E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	2.7E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	--	--	na	1.2E+03
Hexachloroethane [C]	0	--	--	na	3.3E+01	--	--	na	4.9E+01	--	--	--	--	--	--	--	--	--	--	na	4.9E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	2.7E-01	--	--	--	--	--	--	--	--	--	--	na	2.7E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone [C]	0	--	--	na	9.6E+03	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	8.7E+01	9.9E+00	na	--	8.7E+01	9.9E+00	na	--	--	--	--	--	--	--	--	--	8.7E+01	9.9E+00	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	8.7E+03	--	--	--	--	--	--	--	--	--	--	na	8.7E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.5E+02	1.6E+01	na	4.6E+03	1.5E+02	1.6E+01	na	5.2E+03	--	--	--	--	--	--	--	--	1.5E+02	1.6E+01	na	5.2E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	7.8E+02	--	--	--	--	--	--	--	--	--	--	na	7.8E+02
N-Nitrosodimethylamine [C]	0	--	--	na	3.0E+01	--	--	na	4.4E+01	--	--	--	--	--	--	--	--	--	--	na	4.4E+01
N-Nitrosodiphenylamine [C]	0	--	--	na	6.0E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
N-Nitrosodi-n-propylamine [C]	0	--	--	na	5.1E+00	--	--	na	7.5E+00	--	--	--	--	--	--	--	--	--	--	na	7.5E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total [C]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	9.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	9.4E-04
Pentachlorophenol [C]	0	4.3E+00	3.3E+00	na	3.0E+01	4.3E+00	3.3E+00	na	4.4E+01	--	--	--	--	--	--	--	--	4.3E+00	3.3E+00	na	4.4E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	9.7E+05	--	--	--	--	--	--	--	--	--	--	na	9.7E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.8E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.8E+03**
Silver	0	2.3E+00	--	na	--	2.3E+00	--	na	--	--	--	--	--	--	--	--	--	**2.3E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	5.9E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.9E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	4.9E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.9E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	5.3E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.3E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.8E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.8E+03**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	4.1E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**4.1E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.9E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.9E+01**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	2.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	4.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.4E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	3.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.5E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	3.5E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.5E+01**
Zinc	0	9.5E+01	9.6E+01	na	2.6E+04	9.5E+01	9.6E+01	na	2.9E+04	--	--	--	--	--	--	--	--	**9.5E+01**	**9.6E+01**	**na**	**2.9E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	7.3E+02
Arsenic	9.0E+01
Barium	na
Cadmium	5.6E-01
Chromium III	3.6E+01
Chromium VI	6.4E+00
Copper	4.3E+00
Iron	na
Lead	5.9E+00
Manganese	na
Mercury	4.6E-01
Nickel	9.9E+00
Selenium	3.0E+00
Silver	9.1E-01
Zinc	3.8E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Mixing Zone Predictions for Culpeper WPCF

Effluent Flow = 6.0 MGD
Stream 7Q10 = 2.7 MGD
Stream 30Q10 = 5.05 MGD
Stream 1Q10 = 1.96 MGD
Stream slope = .001 ft/ft
Stream width = 25 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.1899 ft
Length = 485.89 ft
Velocity = .4527 ft/sec
Residence Time = .0124 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.3812 ft
Length = 425.2 ft
Velocity = .4954 ft/sec
Residence Time = .0099 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 1.126 ft
Length = 510.38 ft
Velocity = .4377 ft/sec
Residence Time = .3239 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

ATTACHMENT 7

Mountain Run Monitoring Data
90' Downstream of Culpeper WWTP
(July 2004 - June 2006)

Annual

	Temp		pH		Hardness
7/18/05	29	7/23/04	7.44	9/23/05	112
6/30/06	25.8	8/18/04	7.27	9/21/04	92
7/23/04	25	4/30/05	7.25 90%	6/20/05	84
8/18/04	24	9/21/04	7.24	6/30/06	82
9/23/05	23.2	6/30/06	7.2	7/23/04	75
8/18/05	23	7/18/05	7.2	11/15/05	74
6/20/05	23	10/26/04	7.17	8/18/04	72
5/26/06	21.7	2/24/06	6.96	8/18/05	68
9/21/04	21	8/18/05	6.96	12/16/04	67
5/23/05	20	2/18/05	6.9	10/26/04	64
4/28/06	19.2	9/23/05	6.8	7/18/05	61
10/26/04	17	11/16/04	6.72	5/26/06	60
11/15/05	16	5/23/05	6.7	3/21/05	60
3/28/06	15.2	12/16/04	6.6	11/16/04	59
4/30/05	13	3/28/06	6.58	4/28/06	58
3/21/05	12	3/21/05	6.56	5/23/05	58
11/16/04	12	1/27/06	6.51	1/26/05	58
2/24/06	11	4/28/06	6.49	2/24/06	56
12/16/04	8	5/26/06	6.4	4/30/05	56
2/18/05	7	11/15/05	6.38	3/28/06	50
1/27/06	5.4	6/20/05	6.3 10%	1/27/06	50
1/26/05	5	1/26/05	6.11	2/18/05	50

66.63636 Average

Summer

	Temp		pH
7/18/05	29	7/23/04	7.44
6/30/06	25.8 90%	8/18/04	7.27
7/23/04	25	9/21/04	7.24
8/18/04	24	6/30/06	7.2
9/23/05	23.2	7/18/05	7.2
8/18/05	23	10/26/04	7.17
6/20/05	23	8/18/05	6.96
9/21/04	21	9/23/05	6.8
10/26/04	17	11/16/04	6.72
11/15/05	16	11/15/05	6.38
11/16/04	12	6/20/05	6.3

Winter

5/26/06	21.7	4/30/05	7.25
5/23/05	20 90%	2/24/06	6.96
4/28/06	19.2	2/18/05	6.9
3/28/06	15.2	5/23/05	6.7
4/30/05	13	12/16/04	6.6
3/21/05	12	3/28/06	6.58
2/24/06	11	3/21/05	6.56
12/16/04	8	1/27/06	6.51
2/18/05	7	4/28/06	6.49
1/27/06	5.4	5/26/06	6.4
1/26/05	5	1/26/05	6.11

VA0061590 Effluent pH Values reported on the DMRs

Monitoring Due	pH Minimum (SU) Limit 6.0 SU	pH Maximum (SU) Limit 9.0 SU
10-Apr-15	6.9	7.5
10-Mar-15	6.8	7.3
10-Feb-15	6.9	7.4
10-Jan-15	7.1	7.5
10-Dec-14	7.1	7.6
10-Nov-14	7.3	7.7
10-Oct-14	7.4	7.7
10-Sep-14	7.2	7.6
10-Aug-14	7.4	7.7
10-Jul-14	7.2	7.6
10-Jun-14	6.9	7.5
10-May-14	7.0	7.5
10-Apr-14	6.3	7.3
10-Mar-14	6.7	7.3
10-Feb-14	6.1	7.0
10-Jan-14	6.4	6.9
10-Dec-13	6.4	7.0
10-Nov-13	6.9	7.5
10-Oct-13	7.2	7.6
10-Sep-13	7.2	7.7
10-Aug-13	7.2	7.8
10-Jul-13	7.2	7.6
10-Jun-13	7.5	7.7
10-May-13	6.9	7.6
10-Apr-13	6.7	7.2
10-Mar-13	6.7	7.2
10-Feb-13	6.7	7.2
10-Jan-13	6.7	7.4
10-Dec-12	6.5	7.1
10-Nov-12	7.1	7.5
10-Oct-12	7	7.6
10-Sep-12	7.3	7.8
10-Aug-12	7.4	7.7
10-Jul-12	7.4	7.7
10-Jun-12	7.4	7.7
10-May-12	7.2	7.7
10-Apr-12	7.1	7.8
10-Mar-12	6.9	7.5
10-Feb-12	6.8	7.4
10-Jan-12	7	7.4
10-Dec-11	7.1	7.5
10-Nov-11	7	7.9
10-Oct-11	7.2	7.6
10-Sep-11	7.3	7.7
10-Aug-11	7.3	7.7
10-Jul-11	7.3	7.8
10-Jun-11	7.2	7.6
10-May-11	7	7.5
10-Apr-11	6.9	7.3
10-Mar-11	6.9	7.3
10-Feb-11	7	7.2
10-Jan-11	7.1	7.3

ATTACHMENT 8

Total Hardness Effluent Data

From DMRs from January 2011 through April 2015

Monitoring required 1/4M

Monitoring Due	Effluent Value (mg/L)	
10-Jan-15	75.6	
10-Sep-14	74.7	
10-May-14	75.6	
10-Apr-14	75.6	
10-Jan-14	75.1	
10-Sep-13	85.0	
10-May-13	96.5	
10-Jan-13	80.3	
10-Apr-12	73.0	
10-Dec-11	72.9	
10-Sep-11	73.2	
10-May-11	83.2	
	78.4	Average Effluent Value

10-Sep-12	3.9	This value was not used in the average calculation, since it appears to be an anomoly.

ATTACHMENT 9

Thompson, Alison (DEQ)

From: Aschenbach, Ernie (DGIF)
Sent: Tuesday, February 24, 2015 4:16 PM
To: Thompson, Alison (DEQ); nhreview (DCR); Hillman, Brett
Cc: ProjectReview (DGIF); Cason, Gladys (DGIF)
Subject: ESSLog 35499; VPDES reissuance DEQ# VA-0061590 for the Culpeper Wastewater Treatment Plant, in Culpeper, VA

Importance: High

We have reviewed the above-referenced VPDES reissuance DEQ# VA-0061590 for the Culpeper Wastewater Treatment Plant, in Culpeper, VA. The receiving water is Mountain Run, with a 7Q10 of 0.1 Million Gallons per Day (MGD). According to the Effluent Characteristics (for the facility) the permittee shall design the 6.0 MGD facility to meet an annual average concentration of 0.22 mg/L at the design flow. The permittee shall comply with a 0.22 mg/L Total Phosphorus annual average beginning January 1 of the calendar year immediately following the first year that the annual average daily flow is 4.5 MGD or greater. The Ammonia as N has a weekly average of 4.5 mg/L and monthly average 3.7 mg/L.

We reiterate our ongoing recommendation to use ultraviolet (UV) disinfection (rather than chlorination disinfection), if practicable. If chlorination becomes necessary and is used, we recommend dechlorination, prior to discharge. Freshwater mussels are known to be sensitive to ammonia. The ammonia limits within the 2013 EPA rule are the best information currently available regarding ammonia levels protective of mussels (not T&E mussels, any mussel species). Therefore, we recommend the EPA values being implemented in this permit for this and all future VPDES permits, if practicable. Provided adherence to the effluent characteristics and permit conditions, we do not anticipate the reissuance of this permit to result in adverse impact to resources under our purview.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend and support coordination with VDCR-DNH regarding the protection of these resources.

Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
P.O. Box 11104
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

Thompson, Alison (DEQ)

From: Hillman, Brett [brett_hillman@fws.gov]
Sent: Tuesday, February 24, 2015 2:37 PM
To: Thompson, Alison (DEQ)
Subject: Re: VPDES VA0061590 Culpeper WPCF

Hey Alison,

Thanks again for giving us the opportunity to review this permit reissuance. We wanted to review it because the federally listed endangered dwarf wedgemussel (*Alasmidonta heterodon*) is known to occur in Mountain Run, the receiving stream of this facility.

The only thing we're concerned about is the concentration of ammonia being discharge. According to the application, the highest measured concentration of ammonia in the effluent is 12.6 mg/L. It is not clear if this an extreme outlier. If it isn't, it is a very troubling data point given that the receiving stream consists mostly of this facility's effluent.

In order to address potential issues of ammonia toxicity, we recommend that the 2013 EPA ammonia criteria be used to determine limits. Although these criteria have not yet been adopted into the Virginia Water Quality Standards, they are more stringent than the current ammonia criteria and are believed to be protective of freshwater mussels.

If you can not implement these criteria, are there any other mechanisms you can use to address this ammonia issue?

Thanks again!
Brett

Brett Hillman
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Phone: 804-824-2420
Fax: 804-693-9032
Email: brett_hillman@fws.gov

On Fri, Feb 13, 2015 at 1:35 PM, Thompson, Alison (DEQ) <Alison.Thompson@deq.virginia.gov> wrote:

Brett,

I have attached the coordination form for the Town of Culpeper Water Pollution Control Facility. The permit has been reassigned to me for the reissuance. They have upgraded the facility to meet the Chesapeake Bay nutrient limitations. They utilized UV disinfection. Please let me know if you need any further information.

Regards,

Alison Thompson

Water Permits Technical Reviewer

Virginia Dept of Environmental Quality

Northern Regional Office

13901 Crown Ct

Woodbridge, VA 22193

(703) 583-3834

alison.thompson@deq.virginia.gov

ATTACHMENT 10

Dissolved Copper Effluent Data
From DMRs from January 2011 through April 2015
Monitoring required 1/4M

Monitoring Due	Effluent Value (ug/L)
10-Apr-15	NR
10-Mar-15	NR
10-Feb-15	NR
10-Jan-15	10.7
10-Dec-14	NR
10-Nov-14	NR
10-Oct-14	NR
10-Sep-14	3.88
10-Aug-14	NR
10-Jul-14	NR
10-Jun-14	NR
10-May-14	3.78
10-Apr-14	3.78
10-Mar-14	NR
10-Feb-14	NR
10-Jan-14	5.72
10-Dec-13	NR
10-Nov-13	NR
10-Oct-13	NR
10-Sep-13	<QL
10-Aug-13	NR
10-Jul-13	NR
10-Jun-13	NR
10-May-13	<QL
10-Apr-13	NR
10-Mar-13	NR
10-Feb-13	NR
10-Jan-13	5.51
10-Dec-12	NR
10-Nov-12	NR
10-Oct-12	NR
10-Sep-12	<QL
10-Aug-12	NR
10-Jul-12	NR
10-Jun-12	NR
10-May-12	NR
10-Apr-12	<QL
10-Mar-12	NR
10-Feb-12	NR
10-Jan-12	NR
10-Dec-11	<QL
10-Nov-11	NR
10-Oct-11	NR
10-Sep-11	<QL
10-Aug-11	NR
10-Jul-11	NR
10-Jun-11	NR
10-May-11	<QL
10-Apr-11	NR
10-Mar-11	NR
10-Feb-11	NR
10-Jan-11	NR

NR = Not Required

Dissolved Zinc Effluent Data
From DMRs from January 2011 through April 2015
Monitoring required 1/4M

Monitoring Due	Effluent Value (ug/L)
10-Apr-15	NR
10-Mar-15	NR
10-Feb-15	NR
10-Jan-15	50.9
10-Dec-14	NR
10-Nov-14	NR
10-Oct-14	NR
10-Sep-14	41.7
10-Aug-14	NR
10-Jul-14	NR
10-Jun-14	NR
10-May-14	48
10-Apr-14	48
10-Mar-14	NR
10-Feb-14	NR
10-Jan-14	47.4
10-Dec-13	NR
10-Nov-13	NR
10-Oct-13	NR
10-Sep-13	37.2
10-Aug-13	NR
10-Jul-13	NR
10-Jun-13	NR
10-May-13	52.1
10-Apr-13	NR
10-Mar-13	NR
10-Feb-13	NR
10-Jan-13	52.5
10-Dec-12	NR
10-Nov-12	NR
10-Oct-12	NR
10-Sep-12	52.1
10-Aug-12	NR
10-Jul-12	NR
10-Jun-12	NR
10-May-12	NR
10-Apr-12	55.4
10-Mar-12	NR
10-Feb-12	NR
10-Jan-12	NR
10-Dec-11	33.9
10-Nov-11	NR
10-Oct-11	NR
10-Sep-11	45.2
10-Aug-11	NR
10-Jul-11	NR
10-Jun-11	NR
10-May-11	<QL
10-Apr-11	NR
10-Mar-11	NR
10-Feb-11	NR
10-Jan-11	NR

NR = Not Required

Alpha-Endosulfan Effluent Data
From DMRs from January 2011 through April 2015
Monitoring required 1/4M

Monitoring Due	Effluent Value (ug/L)
10-Apr-15	NR
10-Mar-15	NR
10-Feb-15	NR
10-Jan-15	<QL
10-Dec-14	NR
10-Nov-14	NR
10-Oct-14	NR
10-Sep-14	<QL
10-Aug-14	NR
10-Jul-14	NR
10-Jun-14	NR
10-May-14	<QL
10-Apr-14	<QL
10-Mar-14	NR
10-Feb-14	NR
10-Jan-14	<QL
10-Dec-13	NR
10-Nov-13	NR
10-Oct-13	NR
10-Sep-13	<QL
10-Aug-13	NR
10-Jul-13	NR
10-Jun-13	NR
10-May-13	<QL
10-Apr-13	NR
10-Mar-13	NR
10-Feb-13	NR
10-Jan-13	<QL
10-Dec-12	NR
10-Nov-12	NR
10-Oct-12	NR
10-Sep-12	<QL
10-Aug-12	NR
10-Jul-12	NR
10-Jun-12	NR
10-May-12	NR
10-Apr-12	<QL
10-Mar-12	NR
10-Feb-12	NR
10-Jan-12	NR
10-Dec-11	<QL
10-Nov-11	NR
10-Oct-11	NR
10-Sep-11	<QL
10-Aug-11	NR
10-Jul-11	NR
10-Jun-11	NR
10-May-11	<QL
10-Apr-11	NR
10-Mar-11	NR
10-Feb-11	NR
10-Jan-11	NR
10-Dec-10	NR
10-Nov-10	NR
10-Oct-10	NR
10-Sep-10	NR
10-Aug-10	NR
10-Jul-10	NR
10-Jun-10	NR

NR = Not Required

ATTACHMENT 11

6.0 - 1.25 - 1.25(3)

"Model Run For U:\Water Permits\VPDES Program\Facility Archive\Mountain Run STP (VA0090212)\2006 Modification\Model\6.0 - 1.25 - 1.25 (3).mod On 8/21/2006 10:37:05 AM"

SUMMER
Town @ 6.0 MGD
High School @ 1.25 MGD
Mountain Run @ 1.25 MGD

"Model is for MOUNTAIN RUN."
"Model starts at the TOWN OF CULPEPER AWT discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1,	2,	0,	7.073,	28

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
6,	8,	3,	,6.5,	28

"Hydraulic Information for Segment 1"

"Length"	"Width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
2,	38,	.7,	.3

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
6.1,	6.509,	19.754,	0,	7.862,	28

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
.5,	.722,	6,	7.254,	.1,	.185,	0,	0

"Output for Segment 1"
"Segment starts at TOWN OF CULPEPER AWT"

"Total" "Dist." "(mi)"	"Segm." "Dist." "(mi)"	"DO" "(mg/l)"	"cBOD" "(mg/l)"	"nBOD" "(mg/l)"
0,	0,	6.509,	19.754,	0
.1,	.1,	6.427,	19.466,	0
.2,	.2,	6.36,	19.182,	0
.3,	.3,	6.306,	18.902,	0
.4,	.4,	6.263,	18.626,	0
.5,	.5,	6.23,	18.354,	0
.6,	.6,	6.205,	18.086,	0
.7,	.7,	6.187,	17.822,	0
.8,	.8,	6.175,	17.562,	0
.9,	.9,	6.168,	17.306,	0
1,	1,	6.166,	17.053,	0
1.1,	1.1,	6.168,	16.804,	0
1.2,	1.2,	6.173,	16.559,	0
1.3,	1.3,	6.18,	16.317,	0
1.4,	1.4,	6.19,	16.079,	0
1.5,	1.5,	6.201,	15.844,	0
1.6,	1.6,	6.214,	15.613,	0
1.7,	1.7,	6.229,	15.385,	0
1.8,	1.8,	6.245,	15.16,	0
1.9,	1.9,	6.261,	14.939,	0
2,	2,	6.278,	14.721,	0

"Discharge/Tributary Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"

6.0 - 1.25 - 1.25(3)

"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
1.25,	8,	3,	,6.5,	28

"Incremental Flow Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.032,	2,	0,	,7.085,	28

"Hydraulic Information for Segment 2"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
5,	38,	.9,	.3

"Initial Mix Values for Segment 2"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
7.382,	6.319,	15.573,	0,	7.872,	28

"Rate Constants for Segment 2. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
.5,	.722,	6,	7.254,	.1,	.185,	0,	0

"Output for Segment 2"
"Segment starts at HIGH SCHOOL WWTP"

"Total" "Dist." "(mi)",	"Segm." "Dist." "(mi)",	"DO", "(mg/l)",	"cBOD", "(mg/l)",	"nBOD" "(mg/l)"
2,	0,	6.319,	15.573,	0
2.1,	.1,	6.321,	15.346,	0
2.2,	.2,	6.326,	15.122,	0
2.3,	.3,	6.333,	14.901,	0
2.4,	.4,	6.342,	14.683,	0
2.5,	.5,	6.353,	14.469,	0
2.6,	.6,	6.365,	14.258,	0
2.7,	.7,	6.378,	14.05,	0
2.8,	.8,	6.393,	13.845,	0
2.9,	.9,	6.408,	13.643,	0
3,	1,	6.424,	13.444,	0
3.1,	1.1,	6.44,	13.248,	0
3.2,	1.2,	6.457,	13.055,	0
3.3,	1.3,	6.474,	12.864,	0
3.4,	1.4,	6.491,	12.676,	0
3.5,	1.5,	6.509,	12.491,	0
3.6,	1.6,	6.527,	12.309,	0
3.7,	1.7,	6.545,	12.129,	0
3.8,	1.8,	6.563,	11.952,	0
3.9,	1.9,	6.581,	11.778,	0
4,	2,	6.598,	11.606,	0
4.1,	2.1,	6.615,	11.437,	0
4.2,	2.2,	6.632,	11.27,	0
4.3,	2.3,	6.649,	11.105,	0
4.4,	2.4,	6.666,	10.943,	0
4.5,	2.5,	6.683,	10.783,	0
4.6,	2.6,	6.7,	10.626,	0
4.7,	2.7,	6.717,	10.471,	0
4.8,	2.8,	6.734,	10.318,	0
4.9,	2.9,	6.75,	10.167,	0
5,	3,	6.766,	10.019,	0
5.1,	3.1,	6.782,	9.873,	0
5.2,	3.2,	6.798,	9.729,	0
5.3,	3.3,	6.813,	9.587,	0
5.4,	3.4,	6.828,	9.447,	0
5.5,	3.5,	6.843,	9.309,	0

5.6,	3.6,	6.858,	9.173,	0
5.7,	3.7,	6.873,	9.039,	0
5.8,	3.8,	6.888,	8.907,	0
5.9,	3.9,	6.902,	8.777,	0
6,	4,	6.916,	8.649,	0
6.1,	4.1,	6.93,	8.523,	0
6.2,	4.2,	6.944,	8.399,	0
6.3,	4.3,	6.957,	8.276,	0
6.4,	4.4,	6.97,	8.155,	0
6.5,	4.5,	6.983,	8.036,	0
6.6,	4.6,	6.996,	7.919,	0
6.7,	4.7,	7.009,	7.803,	0
6.8,	4.8,	7.022,	7.689,	0
6.9,	4.9,	7.034,	7.577,	0
7,	5,	7.046,	7.466,	0

"Discharge/Tributary Input Data for Segment 3"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
1.25,	8,	3,	,6.5,	28

"Incremental Flow Input Data for Segment 3"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
.203,	2,	0,	,7.093,	28

"Hydraulic Information for Segment 3"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
1.5,	38,	1,	.3

"Initial Mix Values for Segment 3"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
8.835,	6.97,	9.183,	0,	7.881,	28

"Rate Constants for Segment 3. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
.3,	.433,	6,	7.254,	.1,	.185,	0,	0

"Output for Segment 3"
"Segment starts at MOUNTAIN RUN WWTP"

"Total",	"Segm."			
"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
7,	0,	6.97,	9.183,	0
7.1,	.1,	7.02,	9.102,	0
7.2,	.2,	7.064,	9.022,	0
7.3,	.3,	7.093,	8.943,	0
7.4,	.4,	7.093,	8.864,	0
7.5,	.5,	7.093,	8.786,	0
7.6,	.6,	7.093,	8.709,	0
7.7,	.7,	7.093,	8.632,	0
7.8,	.8,	7.093,	8.556,	0
7.9,	.9,	7.093,	8.481,	0
8,	1,	7.093,	8.406,	0
8.1,	1.1,	7.093,	8.332,	0
8.2,	1.2,	7.093,	8.259,	0
8.3,	1.3,	7.093,	8.186,	0
8.4,	1.4,	7.093,	8.114,	0

```
                                                    6.0 - 1.25 - 1.25(3)
8.5,      1.5,        7.093,      8.043,      0
```

"END OF FILE"

6.0 - 1.25 - 1.25 (4) Seasonal

"***SEASONAL RUN***"
"Wet Season is from December to May."
"Model Run For U:\Water Permits\VPDES Program\Facility Archive\Mountain Run STP (VA0090212)\2006 Modification\Model\6.0 - 1.25 - 1.25 (3).mod On 9/25/2006 11:40:27 AM"

"Model is for MOUNTAIN RUN."
"Model starts at the TOWN OF CULPEPER AWT discharge."

WINTER
Town @ 6.6 MGD
High School @ 1.25 MGD
Mountain Run @ 1.25 MGD

"Background Data"
"7Q10", "cBOD5", "TKN", "DO", "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
4.152, 2, 0, 8.091, 20

"Discharge/Tributary Input Data for Segment 1"
"Flow", "cBOD5", "TKN", "DO", "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
6, 12, 8, ,6.5, 20

"Hydraulic Information for Segment 1"
"Length","Width", "Depth", "Velocity"
"(mi)", "(ft)", "(ft)", "(ft/sec)"
2, 38, 8.959033, 4.613949E-02

"Initial Mix Values for Segment 1"
"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
10.152, 7.151, 19.775, 12.796, 8.993, 20

"Rate Constants for Segment 1. - (All units Per Day)"
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"
.5, .5, 6, 6, .2, .2, 0, 0

"Output for Segment 1"
"Segment starts at TOWN OF CULPEPER AWT"
"Total", "Segm."
"Dist.", "Dist.", "DO", "cBOD", "nBOD"
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"
0, 0, 7.151, 19.775, 12.796
.1, .1, 7.06, 18.508, 12.461
.2, .2, 7.081, 17.322, 12.135
.3, .3, 7.148, 16.212, 11.818
.4, .4, 7.233, 15.173, 11.509
.5, .5, 7.323, 14.201, 11.208
.6, .6, 7.412, 13.291, 10.915
.7, .7, 7.497, 12.439, 10.63
.8, .8, 7.578, 11.642, 10.352
.9, .9, 7.655, 10.896, 10.081
1, 1, 7.728, 10.198, 9.817
1.1, 1.1, 7.796, 9.545, 9.56
1.2, 1.2, 7.86, 8.933, 9.31
1.3, 1.3, 7.92, 8.361, 9.067
1.4, 1.4, 7.977, 7.825, 8.83
1.5, 1.5, 8.031, 7.324, 8.599
1.6, 1.6, 8.081, 6.855, 8.374
1.7, 1.7, 8.094, 6.416, 8.155
1.8, 1.8, 8.094, 6.005, 7.942
1.9, 1.9, 8.094, 5.62, 7.734
2, 2, 8.094, 5.26, 7.532

"Discharge/Tributary Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
1.25,	12,	8,	,6.5,	20

"Incremental Flow Input Data for Segment 2"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
1.32864,	2,	0,	,8.104,	20

"Hydraulic Information for Segment 2"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
5,	38,	11.51876,	4.500149E-02

"Initial Mix Values for Segment 2"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
12.7306,	7.939,	7.662,	8.132,	9.004,	20

"Rate Constants for Segment 2. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
.3,	.3,	6,	6,	.15,	.15,	0,	0

"Output for Segment 2"
"Segment starts at HIGH SCHOOL WWTP"

"Total", "Segm."				
"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
2,	0,	7.939,	7.662,	8.132
2.1,	.1,	8.104,	7.356,	7.968
2.2,	.2,	8.104,	7.062,	7.807
2.3,	.3,	8.104,	6.78,	7.65
2.4,	.4,	8.104,	6.509,	7.496
2.5,	.5,	8.104,	6.249,	7.345
2.6,	.6,	8.104,	6,	7.197
2.7,	.7,	8.104,	5.76,	7.052
2.8,	.8,	8.104,	5.53,	6.91
2.9,	.9,	8.104,	5.309,	6.771
3,	1,	8.104,	5.097,	6.634
3.1,	1.1,	8.104,	5,	6.5
3.2,	1.2,	8.104,	5,	6.369
3.3,	1.3,	8.104,	5,	6.241
3.4,	1.4,	8.104,	5,	6.115
3.5,	1.5,	8.104,	5,	5.992
3.6,	1.6,	8.104,	5,	5.871
3.7,	1.7,	8.104,	5,	5.753
3.8,	1.8,	8.104,	5,	5.637
3.9,	1.9,	8.104,	5,	5.523
4,	2,	8.104,	5,	5.412
4.1,	2.1,	8.104,	5,	5.303
4.2,	2.2,	8.104,	5,	5.196
4.3,	2.3,	8.104,	5,	5.091
4.4,	2.4,	8.104,	5,	4.988
4.5,	2.5,	8.104,	5,	4.887
4.6,	2.6,	8.104,	5,	4.788
4.7,	2.7,	8.104,	5,	4.691
4.8,	2.8,	8.104,	5,	4.596
4.9,	2.9,	8.104,	5,	4.503
5,	3,	8.104,	5,	4.412
5.1,	3.1,	8.104,	5,	4.323
5.2,	3.2,	8.104,	5,	4.236
5.3,	3.3,	8.104,	5,	4.151

5.4,	3.4,	8.104,	5,	4.067
5.5,	3.5,	8.104,	5,	3.985
5.6,	3.6,	8.104,	5,	3.905
5.7,	3.7,	8.104,	5,	3.826
5.8,	3.8,	8.104,	5,	3.749
5.9,	3.9,	8.104,	5,	3.673
6,	4,	8.104,	5,	3.599
6.1,	4.1,	8.104,	5,	3.526
6.2,	4.2,	8.104,	5,	3.455
6.3,	4.3,	8.104,	5,	3.385
6.4,	4.4,	8.104,	5,	3.317
6.5,	4.5,	8.104,	5,	3.25
6.6,	4.6,	8.104,	5,	3.184
6.7,	4.7,	8.104,	5,	3.12
6.8,	4.8,	8.104,	5,	3.057
6.9,	4.9,	8.104,	5,	2.995
7,	5,	8.104,	5,	2.935

"Discharge/Tributary Input Data for Segment 3"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
1.25,	12,	8,	,6.5,	20

"Incremental Flow Input Data for Segment 3"

"Flow",	"cBOD5",	"TKN",	"DO",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
8.42856,	2,	0,	,8.113,	20

"Hydraulic Information for Segment 3"

"Length",	"Width",	"Depth",	"Velocity"
"(mi)",	"(ft)",	"(ft)",	"(ft/sec)"
1.5,	38,	12.79862,	7.129277E-02

"Initial Mix Values for Segment 3"

"Flow",	"DO",	"cBOD",	"nBOD",	"DOSat",	"Temp"
"(mgd)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"(mg/l)",	"deg C"
22.4092,	8.018,	6.395,	2.875,	9.015,	20

"Rate Constants for Segment 3. - (All units Per Day)"

"k1",	"k1@T",	"k2",	"k2@T",	"kn",	"kn@T",	"BD",	"BD@T"
.3,	.3,	6,	6,	.1,	.1,	0,	0

"Output for Segment 3"
"Segment starts at MOUNTAIN RUN WWTP"

"Total",	"Segm."			
"Dist.",	"Dist.",	"DO",	"cBOD",	"nBOD"
"(mi)",	"(mi)",	"(mg/l)",	"(mg/l)",	"(mg/l)"
7,	0,	8.018,	6.395,	2.875
7.1,	.1,	8.113,	6.233,	2.85
7.2,	.2,	8.113,	6.075,	2.826
7.3,	.3,	8.113,	5.921,	2.802
7.4,	.4,	8.113,	5.771,	2.778
7.5,	.5,	8.113,	5.624,	2.754
7.6,	.6,	8.113,	5.481,	2.73
7.7,	.7,	8.113,	5.342,	2.707
7.8,	.8,	8.113,	5.206,	2.684
7.9,	.9,	8.113,	5.074,	2.661
8,	1,	8.113,	5,	2.638
8.1,	1.1,	8.113,	5,	2.615
8.2,	1.2,	8.113,	5,	2.593

```
                                    6.0 - 1.25 - 1.25 (4) Seasonal
8.3,      1.3,      8.113,     5,          2.571
8.4,      1.4,      8.113,     5,          2.549
8.5,      1.5,      8.113,     5,          2.527


"END OF FILE"
```

ATTACHMENT 12

9/2/2009 8:51:25 AM

Facility = Town of Culpeper 6 MGD
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 28
WLAc = 3.7
Q.L. = .2
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 7.46537934564035
Average Weekly limit = 4.45313674786387
Average Monthly LImit = 3.7

The data are:

9

4/22/2015 8:42:27 AM

Facility = Culpeper WPCF
Chemical = Copper
Chronic averaging period = 4
WLAa = 11
WLAc = 7.3
Q.L. = 1.0
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 13
Expected Value = 1.11849
Variance = .450374
C.V. = 0.6
97th percentile daily values = 2.72177
97th percentile 4 day average = 1.86094
97th percentile 30 day average= 1.34896
< Q.L. = 7
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

0
0
0
0
0
5.51
0
0
5.72
3.78
3.78
3.88
10.7

4/22/2015 8:32:51 AM

Facility = Culpeper WPCF
Chemical = Alpha Endosulfan
Chronic averaging period = 4
WLAa = 0.22
WLAc = 0.056
Q.L. = .1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 13
Expected Value =
Variance =
C.V. =
97th percentile daily values =
97th percentile 4 day average =
97th percentile 30 day average=
< Q.L. = 13
Model used =

No Limit is required for this material

The data are:

0
0
0
0
0
0
0
0
0
0
0
0
0

4/22/2015 8:48:21 AM

Facility = Culpeper WPCF
Chemical = Zinc
Chronic averaging period = 4
WLAa = 95
WLAc = 96
Q.L. = 20
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 13
Expected Value = 45.0147
Variance = 98.0984
C.V. = 0.220027
97th percentile daily values = 61.6444
97th percentile 4 day average = 54.9938
97th percentile 30 day average= 48.4161
< Q.L. = 1
Model used = delta lognormal

No Limit is required for this material

The data are:

0
45.2
33.9
55.4
52.1
52.5
52.1
37.2
47.4
48
48
41.7
50.9

ATTACHMENT 13

MEMORANDUM

SUBJECT: VPDES Permit No. VA0061590, Town of Culpeper WPCF; VPDES Modification; Culpeper County

TO: VPDES Permit No. VA0061590 Permit File

FROM: Joan C. Crowther

DATE: October 18, 2011, Updated December 6, 2011

By their April 7, 2011 email, the Town of Culpeper requested a major permit modification for Town of Culpeper Treatment Plant's VPDES Permit No. VA0061590. This memorandum appends the 2010 Fact Sheet (Attachment 1) supporting the VPDES Permit effective March 10, 2010. The information contained in this memo replaces the information in the original 2010 fact sheet. The Town requested the increase of the Total Nitrogen (TN) annual average concentration effluent limitation from 3.0 mg/L to 4.0 mg/L.

By letter dated August 24, 2010, from Mr. David E. Evans of McGuire Woods, DEQ was notified that the Culpeper County Board of Supervisors and the Culpeper Town Council unanimously approved the Nutrient Allocation Consolidation Agreement on August 17, 2010 (Attachment 2). This Agreement transferred and consolidated the Mountain Run Plant Allocations (TN and TP) with the Town of Culpeper's Allocations. This results in the increase of the Total Nitrogen annual average effluent concentration from 3.0 mg/L to 4.0 mg/L and allows the Total Phosphorus annual average effluent concentration to be 0.30 mg/L for the Town of Culpeper Wastewater Treatment Plant's VPDES Permit No. VA0061590. The Town of Culpeper's Virginia Water Quality Improvement Fund, Point Source Grant and Operation and Maintenance Agreement (Grant # 440-S-07-18) was modified to state that the Total Nitrogen annual concentration effluent limitation for the Town of Culpeper Wastewater Treatment Plant would be 4.0 mg/L (Attachment 3). Based on these two documents, the Town of Culpeper Wastewater Treatment Plant's VPDES Permit No. VA0061590 is being modified to reflect this Total Nitrogen annual concentration effluent limitation change.

Documentation supporting the Total Nitrogen and Total Phosphorus Annual Concentration Averages:

1) The Watershed General Permit authorizes the Town of Culpeper WPCF to discharge 54,820 pounds per year (lbs/yr) of the nutrient total nitrogen and 4,112 lbs/yr of the nutrient total phosphorus. The Watershed General Permit incorporates the nutrient allocations for TN and TP in such amounts as set forth in the State Water Control Board's Water Quality Management Planning Regulation, 9 VAC 25-720-70.C, which are derived for this facility based on a design flow capacity of 4.5 MGD.

2) The Watershed General Permit authorizes Mountain Run Wastewater Treatment Plant to discharge 18,273 lbs/yr of the nutrient total nitrogen and 1,371 lbs/yr of the nutrient total phosphorus. The Watershed General Permit incorporates the nutrient allocations for TN and TP in such amounts as set forth in the State Water Control Board's Water Quality Management Planning Regulation, 9 VAC 25-720-70.C, which are derived for this facility based on a design flow capacity of 1.5 MGD.

3) Per the Nutrient Allocation Consolidation Agreement between Town of Culpeper and the County of Culpeper dated August 17, 2011, the Mountain Run Wastewater Treatment Plant's Allocation (TN and TP) were transferred to and consolidated with Town of Culpeper's Allocation. DEQ modified the General Permit Registration to reflect the transfer of wasteload allocation on May 10, 2011.

Town of Culpeper TN loading = 54,820 lbs/yr
Town of Culpeper TP loading = 4,112 lbs/yr

Mountain Run WWTP TN loading = 18,273 lbs/yr
Mountain Run WWRP TP loading = 1,371 lbs/yr

Nutrient Annual Concentration Average = Facility's TN or TP Allocation (lbs/yr) ÷ 365 days per year ÷ 8.3438 (conversion factor) ÷ Facility Design Flow (MGD)

TN Annual Concentration Average (mg/L) = 54,820 lbs/yr + 18,273 lbs/yr ÷ 365 ÷ 8.3438 ÷ 6.0 MGD
= 4.0 mg/L

TP Annual Concentration Average (mg/L) = 4,112 lbs/yr + 1,371 lbs/yr ÷ 365 ÷ 8.3438 ÷ 6.0 MGD
= 0.30 mg/L

Since the VPDES Permit No. VA0061590 is being modified, staff is taking this opportunity to make additional modifications to the permit that are either no longer effective or typographical errors. This permit modification implements the following changes to the VPDES permit:

1. Removes the Part I.A Effluent Limitations for the 4.0 MGD design flow (Page 1 of 14). The Certificate To Operate the 6.0 MGD design flow facility was issued April 22, 2010 (Attachment 4).

2. Increases the Total Nitrogen (TN) annual average concentration effluent limitations from 3.0 mg/L to 4.0 mg/L for the 6.0 MGD design flow. This is accomplished by updating the effluent limitations for TN on the 6.0 MGD effluent limitation page of the permit.

3. Removed the Total Phosphorus annual average concentration effluent footnote that required the permittee to design the 6.0 MGD facility to meet a 0.22 mg/L.

4. Corrects the typographical error contained in Part I.F.9.b. Special Condition - Instream Monitoring frequency so that it is consistent with the effluent dissolved copper, dissolved zinc, and Total Hardness monitoring frequency. The Instream Monitoring was decreased from quarterly monitoring to once every four (4) months.

5. Removes Part I.F.10 – 11 Special Conditions for Groundwater Monitoring. Pursuant to Part I.F.11, the groundwater monitoring could be terminated if so requested by the permittee and that the groundwater showed no groundwater contamination. The groundwater monitoring was terminated by DEQ on August 24, 2011.

6. Revises the numbering sequence of the permit special conditions after removing the conditions noted above from the permit.

7. Corrected typographical error (namely, removes the extra "the" in Part I.D.1.f. sentence).

8. Updated Part II,A.4. that requires the permittee to analyze samples required by this permit in accordance with 1VAC30-45, Certification for Noncommercial Environmental Laboratories, or 1VAC30-46, Accreditation for Commercial Environmental Laboratories.

The 2010 Fact Sheet information is amended as follows:

1. Section 19(a) – Removal of the 4.0 MGD Effluent Limitations/Monitoring Requirements Table.

2. Section 19(b) – Removal of the "$" footnote for the Total Phosphorus Calendar Year effluent limitation.

3. Section 21(l-m) - Removal of the Groundwater Monitoring Plan and Corrective Action Plan Special Conditions supporting document.

4. Section 23 – Changes to the Permit from the Previously Issued Permit – See previous paragraph.

5. Section 25 – Public Notice Information:

   First Public Notice Date: November 5, 2011 Second Public Notice Date: November 12, 2011
   Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3925, joan.crowther@deq.virginia.gov. See Attachment 5 for a copy of the public notice document.

   Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal

statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

6. Section 27 - Additional Comments:

Previous Board Action(s): On December 9, 2010, the Town of Culpeper was issued an Order by Consent for the Town of Culpeper WPCF. This Order addressed effluent violations for January 2009; namely, TKN (weekly maximum concentration) and Ammonia (monthly average and weekly maximum concentrations); pump stations overflows; namely, Pump Station No. 1 on June 26, 2009 and Pump Station No. 4 on August 4, 2009; and required the Town to repair the liner in equalization lagoon cell number 1 of the by July 15, 2011. The Certificate To Operate the equalization lagoon was issued on April 19, 2011. The Order by Consent was terminated by the State Water Control Board on May 31, 2011.

Staff Comments: During the final review of the permit package, one additional typographical error was noted on VPDES Permit No. VA0061590, Page 1 of 12, Part I,A.1 regarding the Total Nitrogen effluent limitation. The sample type was listed as "24H-C" when it should have been "Calculated". This typographical error was corrected.

Public Comment: One public comment was received during the public comment period of November 5, 2001 through December 5, 2011. On December 5, 2011, an email was received from Mr. Greg Wichelns, District Manager of the Culpeper Soil and Water Conservation, relaying questions/comments on behalf of Ms. Laura Campbell, a Culpeper District Director and a downstream property owner. Only one of the three questions/concerns pertained to the permit modification, namely Comment no. 3, "It was unclear to the commentor if the Greens Corner WWTP (temporary?) was included in the consolidation. Please clarity this." In accordance with the Nutrient Allocation Consolidation Agreement, only the nutrient allocations associated with the Mountain Run WWTP were transferred to the Town of Culpeper WPCF. Greens Corner WWTP nutrient allocations were not involved in this agreement.

Although the two other questions/concerns were not subject to public comment, staff did respond to them. They were as follows:

1) "The commentor is concerned about the increase flow from the plant adding to channel instability during higher or bankfull flow events. Has any evaluation of this occurred?

When a discharge is requested into state waters, the stream channel is taken into consideration during the stream modeling process. A description of the stream characteristics are incorporated into the stream model along with the 7Q10 stream flow and wastewater treatment plant's existing and future design flows. The stream model determines the appropriate effluent limitations to ensure water quality standards are maintained. However, there is no analysis performed to determine stream bank stability.

2) "The commentor questioned the *E.coli* limit currently (?) in place for the plant. It appears that it was amended earlier to a level equal to the surface water quality standard for *E.coli*. Is this accurate? How does this interact with any possible future delisting efforts (303d) for Mountain Run?

During the 2010 Permit Reissuance (effective date March 10, 2010), the Town asked that the *E. coli* geometric mean monthly average limit be raised from 39 n/100mL to 126 n/100mL. The Mountain Run TMDL approved in 2001 and modified in 2009 established an *E.coli* wasteload allocation for the Town of Culpeper WPCF of 3.23E+12 cfu/year

which is equivalent to 39 n/100mL monthly average geometric mean effluent limit at their permitted design flow of 6.0 MGD. The Town's request was granted by incorporating a monthly average geometric mean effluent limitation of 126 n/100mL into the 2010 permit reissuance. However, the permit also contains an *E.coli* 12- month maximum load of 3.23E+12 cfu/yr. to comply with the wasteload allocation contained in the approved TMDL. Since this wasteload allocation has been designated for the Town's wastewater treatment plant in the TMDL, any future 303(d) delisting efforts for Mountain Run will not be hampered.

EPA Checklist: The checklist can be found in Attachment 6.

7. List of Attachments:
   Attachment 1 – 2010 Permit Fact Sheet
   Attachment 2 – Culpeper Nutrient Allocation Consolidation Agreement and transmittal letter dated August 24, 2010
   Attachment 3 – Virginia Water Quality Improvement Fund, Point Source Grant and Operation and Maintenance Agreement, Grant # 440-S-07-18
   Attachment 4 – Certificate To Operate (6.0 MGD) dated April 22, 2010
   Attachment 5 – Permit Modification Public Notice
   Attachment 6 – EPA Checklist

ATTACHMENT 14

Phone: 804.775.1000
Fax: 804.775.1061
www.mcguirewoods.com

David E. Evans
Direct: 1.804.775.4317

McGUIREWOODS

devans@mcguirewoods.com
Direct Fax: 1.804.698.2049

August 24, 2010

BY HAND DELIVERY

Mr. Alan E. Pollock
Office of Water Quality Programs
Department of Environmental Quality
Commonwealth of Virginia
629 East Main Street
Richmond, VA 23219

Mr. John M. Kennedy
Chesapeake Bay Program Office
Department of Environmental Quality
Commonwealth of Virginia
629 East Main Street
Richmond, VA 23219

Re: Culpeper Nutrient Allocation Consolidation Agreement

Dear Alan and John:

Following up on my email to you'll last week and my telephone conversation with Alan last Friday, this will confirm that the Culpeper County Board of Supervisors and the Culpeper Town Council unanimously approved the Nutrient Allocation Consolidation Agreement on August 17. An original executed copy of the Agreement is enclosed.

Based on our conference call earlier this month and with the executed Agreement now in hand, we understand that the State will show the County's Mountain Run allocations consolidated in the Town's plant when it submits its preliminary Watershed Implementation Plan to EPA on September 1.

Again, many thanks for your assistance and please let me know if you have any questions.

Sincerely,

David E. Evans

Enclosure

c: Alan Brockenbrough - DEQ
Arthur Butt - DEQ
Frank T. Bossio - County Administrator
Roy B. Thorpe, Jr. - County Attorney
Christopher D. Pomeroy

NUTRIENT ALLOCATION CONSOLIDATION AGREEMENT

THIS NUTRIENT ALLOCATION CONSOLIDATION AGREEMENT (this "Agreement") made this 17th day of August, 2010, by and between the Town of Culpeper, Virginia (the "Town") and the County of Culpeper, Virginia (the "County"), both of which are political subdivisions of the Commonwealth of Virginia (each a "Party" and collectively the "Parties").

BACKGROUND

A. The Town owns and operates a publicly-owned treatment works (the "Town Plant") with which the Town currently provides or in the future may provide wastewater treatment services for municipal wastewater generated within the Town's corporate limits as of the date of this Agreement (the "Town Area") and within portions of the County beyond the Town's corporate limits as of the date of this Agreement (the "County Area").

B. The Town Plant discharges highly treated wastewater pursuant to an individual Virginia Pollutant Discharge Elimination System permit (the "VPDES Permit") issued by the Virginia Department of Environmental Quality ("DEQ") to the Town.

C. The Town Plant is also subject to the General Virginia Pollutant Discharge Elimination System Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia, 9 VAC 25-820, issued by the State Water Control Board ("SWCB") and DEQ effective January 1, 2007 and as hereafter modified or reissued from time to time (the "Watershed General Permit").

D. The Watershed General Permit authorizes the Town Plant to discharge 54,820 pounds per year ("lbs/yr") of the nutrient total nitrogen ("TN") and 4,112 lbs/yr of the nutrient total phosphorus ("TP"). In this manner, the Watershed General Permit incorporates the nutrient allocations for TN and TP in such amounts (collectively, the "Town Plant Allocations") as set forth in the SWCB's Water Quality Management Planning Regulation, 9 VAC 25-720-70.C, which are derived for this facility based on a design capacity of 4.5 million gallons per day ("MGD").

E. The County has long planned and taken steps toward the construction of a publicly-owned treatment works known as the Mountain Run Plant, which has been intended to serve the County Area.

F. The Watershed General Permit authorizes the Mountain Run Plant to discharge 18,273 lbs/yr of TN and 1,371 lbs/yr of TP. In this manner, the Watershed General Permit incorporates the nutrient allocations for TN and TP in such amounts (collectively, the "Mountain Run Plant Allocations") as set forth in the SWCB's Water Quality Management Planning Regulation, 9 VAC 25-720-70.C, which are derived for this facility based on a design capacity of 1.5 MGD.

G. The Parties recognize the inefficiencies associated with continuing to construct and operate their own separate wastewater treatment works to serve the Town Area and the County Area as well as the water quality and land use benefits of consolidating wastewater treatment in a single facility. For this reason, the Parties have agreed to consolidate treatment of their respective wastewater flows by expansion of the Town Plant in lieu of operating both of the above-referenced facilities. Consistent with this intent, the Town Plant's VPDES Permit authorizes the discharge of treated wastewater at a design flow rate of 6.0 MGD, and the Town Plant has been expanded to a capacity of 6.0 MGD and upgraded to include nutrient removal technology, all as of March 2010 at which time the Town requested a Certificate to Operate from DEQ, which has since been issued.

H. In further support of the consolidation of wastewater treatment at the Town Plant (6.0 MGD), it is also the intent of the Town and County to consolidate the Town Plant Allocations (based on 4.5 MGD) and the Mountain Run Plant Allocations (based on 1.5 MGD) on a permanent basis pursuant to the Watershed General Permit, 9 VAC 25-820-70, Part I B 3, as provided below.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual covenants and conditions herein, and for good and valuable consideration, the receipt and sufficiency of which the Parties hereby acknowledge, the Parties agree as follows.

1. Nutrient Allocation Consolidation. The Mountain Run Plant Allocations (TN and TP) are hereby transferred to and consolidated with the Town Plant Allocations (TN and TP) subject to approval by DEQ. Such consolidation shall be effective upon approval by DEQ. By August 15, 2010 or as soon as practical thereafter, the Town and County shall jointly submit a written request to DEQ requesting DEQ's approval of such consolidation and a corresponding update to its Watershed General Permit Registration List.

2. Mutual Cooperation. The Parties shall continue to cooperate with each other in any manner reasonably necessary to accomplish or bring about the consolidation of the Mountain Run Plant Allocations with the Town Plant Allocations as provided under this Agreement.

3. No Charges. There shall be no monetary charge by either Party to the other Party for the consolidation of nutrient allocations as provided under this Agreement. Each of the Parties shall bear its own fees and expenses, including its own counsel fees, incurred in connection with this Agreement. This Agreement shall not be interpreted as establishing an obligation on the Town to provide wastewater facilities or services for the benefit of the County or its residents, it being the intent of the Parties that such obligations and charges related to such facilities and services are to be established by separate agreement(s).

4. Authorization. Each Party represents that its execution, delivery and performance under this Agreement have been duly authorized by all necessary action on its behalf, and do not and will not violate any provision of its charter or result in a material breach of or constitute a material default under any agreement, indenture, or instrument of which it is a party or by which

it or its properties may be bound or affected. To each Party's knowledge there are no actions, suits or proceedings pending or threatened against such Party or any of its properties, before any court or governmental authority that, if determined adversely to such Party, would have a material adverse effect on the transactions contemplated by this Agreement.

5. No Third Party Beneficiaries. This Agreement is solely for the benefit of the Parties hereto and their permitted successors and assignees and shall not confer any rights or benefits on any other person.

6. No Assignment. This Agreement, and the rights and privileges granted to the Parties pursuant to this Agreement, shall be binding upon and inure to the benefit of any successors of such Parties. Neither Party may transfer or assign this Agreement, or its rights or obligations hereunder, without the prior written consent of the other Party, which consent may be withheld in such Party's discretion.

7. Governing Law; Severability. This Agreement shall be construed in accordance with and governed for all purposes by the laws of the Commonwealth of Virginia. If any word or provision of this Agreement as applied to any Party or to any circumstance is adjudged by a court to be invalid or unenforceable, the same shall in no way affect any other circumstance or the validity or enforceability of any other word or provision.

8. Change in Law. In the event of any material change in applicable laws or regulations, the Parties shall work together to amend this Agreement to conform to such change, while maintaining as closely as practical the provisions and intent of this Agreement.

9. Entire Agreement; Amendments. This Agreement contains the entire agreement between the Parties as to the subject matter hereof and supersedes all previous written and oral negotiations, commitments, proposals and writings as to the consolidation of Mountain Run Plant Allocations with the Town Plant Allocations. No amendments may be made to this Agreement except by a writing signed by both Parties.

10. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Parties hereto have caused the execution of this Agreement as of the date first written above.

[SIGNATURES ON NEXT PAGE]

TOWN OF CULPEPER, VIRGINIA

By: _____
Calvin L. Coleman, Jr.
Mayor

Attest:

_____
Kimberly D. Allen
Town Clerk

Approved As To Form:

_____
Robert W. Bendall
Town Attorney

COUNTY OF CULPEPER, VIRGINIA

By: _____
Brad C. Rosenberger
Chairman, Board of Supervisors

Attest:

_____
Frank T. Bossio
County Clerk

Approved As To Form:

_____
Roy B. Thorpe, Jr.
County Attorney

VIRGINIA WATER QUALITY IMPROVEMENT FUND

POINT SOURCE GRANT AND
OPERATION AND MAINTENANCE AGREEMENT

Grantee Town of Culpeper
Grant: #440-S-07-18

CONTRACT MODIFICATION NO. 2

A. Delete existing Section 2., in Article II, Scope of Project, and substitute in its place the following:

2. The Grantee will cause the Project to be designed, constructed and placed in operation as described in Exhibit A to this Agreement to meet effluent concentration limitations of 4.0 mg/l for total nitrogen, and 0.30 mg/l for total phosphorus, both on an annual average basis.

B. Delete existing Section 4.0, in Article IV, Compensation, and substitute in its place the following:

4.0. Grant Amount. The total grant award from the Fund under this Agreement is $5,632,226 and represents the Commonwealth's forty-five percent (45%) share of the eligible Project Costs. Any material changes made to the Project after execution of this Agreement, which alter the Project Costs, will be submitted to the Department for review of grant eligibility. The amount of the grant award set forth herein may be modified from time to time by agreement of the parties to reflect changes to the Project and/or grant eligible Project Costs.

C. Delete existing Section 5.0, in Article V, Performance, and substitute in its place the following:

5.0 The Grantee's Facility shall meet a total nitrogen effluent concentration limitation of 4.0 mg/l, and a total phosphorus effluent concentration limitation of 0.30 mg/l, both on an annual average basis, except as provided in paragraph 5.1 and Article VIII of this Agreement.

D. Delete the first paragraph of existing Section 8.2, in Article VIII, Material Breach, and substitute in its place the following:

8.2. Monetary Assessments for Breach. In no event shall total Monetary Assessments pursuant to this Agreement exceed (i) $451,700 annually or (ii) $9,034,000 during the life of this Agreement. Monetary Assessments will be paid into the State Treasury and credited to the Fund. The Director's right to collect Monetary Assessments does not affect in any way the Director's right to secure specific performance of this Agreement using such other legal remedies as may otherwise be available. Within ninety (90) days of receipt of written demand from the Director, the Grantee shall pay the following Monetary Assessments for the corresponding material breaches of this Agreement unless the Grantee asserts a defense pursuant to the requirements of Section 8.3 herein.

E. Delete existing Exhibit F, Formula for Calculating Monetary Assessment for Exceedance of Numerical Nitrogen and Phosphorus Concentrations, and substitute in its place the following two pages:

EXHIBIT F

FORMULA FOR CALCULATING MONETARY ASSESSMENT FOR EXCEEDANCE OF NUMERICAL NITROGEN CONCENTRATIONS

Grantee: Town of Culpeper
Grant: #440-S-07-18

Section 1: Nitrogen Exceedances

$$CN = (TNe/TNr) \times AnPay \times PerGrant$$

where:

CN	=	Assessment for Nitrogen Exceedance.
TNe	=	Exceedance in tenths of a milligram per liter.
TNr	=	Expected nitrogen removal (difference between "pre-nutrient removal" annual average concentration and 4.0 mg/l limitation) in tenths of a milligram per liter.
AnPa	=	Annual Payment on grant; assumes principal payments amortized over 20 years and an interest rate of 5 percent. Using these assumed values leads to a "cost recovery factor" of 0.0802. The "cost recovery factor" times the grant amount yields the Annual Payment amount.
PerGrant	=	Percentage of grant received by year of exceedance.

Values used for Grant #440-S-07-18

Pre-Nutrient Removal TN Concentration	= 9.73 mg/l
Effluent TN Concentration Limitation	= 4.0 mg/l
Total Grant Amount for TN Removal	= $4,495,067
Useful Service Life	= 20 years
Interest Rate	= 5 percent

Calculated (assumes grant paid 100%):

Expected Removal (TNr)	= 5.73 mg/l
AnPay	= $360,500
CN	= $6,290 (for each 0.1 mg/l TN exceedance)

EXHIBIT F

FORMULA FOR CALCULATING MONETARY ASSESSMENT
FOR EXCEEDANCE OF
NUMERICAL PHOSPHORUS CONCENTRATIONS

Grantee: Town of Culpeper
Grant: #440-S-07-18

Section 2: Phosphorus Exceedances

$$CP = (TPe/TPr) \times AnPay \times PerGrant$$

where:

CP	=	Assessment for Phosphorus Exceedance.
TPe	=	Exceedance in tenths of a milligram per liter.
TPr	=	Expected phosphorus removal (difference between "pre-nutrient removal" annual average concentration and 0.30 mg/l limitation) in tenths of a milligram per liter.
AnPay	=	Annual Payment on grant; assumes principal payments amortized over 20 years and an interest rate of 5 percent. Using these assumed values leads to a "cost recovery factor" of 0.0802. The "cost recovery factor" times the grant amount yields the Annual Payment amount.
PerGrant	=	Percentage of grant received by year of exceedance.

Values used for Grant #440-S-07-18:

Pre-Nutrient Removal TP Concentration	= 1.26 mg/l
Effluent TP Concentration Limitation	= 0.30 mg/l
Total Grant Amount for TP Removal	= $1,137,159
Useful Service Life	= 20 years
Interest Rate	= 5 percent

Calculated (assumes grant paid 100%):

Expected Removal (TPr)	= 0.96 mg/l
AnPay	= $91,200
CP	= $9,500 (for each 0.1 mg/l TP exceedance)

The contracting parties have caused the Agreement to be modified by the following duly authorized signatures:

GRANTEE	**GRANTOR**
Town of Culpeper	Department of Environmental Quality
BY: _____	BY: _____
TITLE: Town Manager	TITLE: _____
DATE: 4/14/11	DATE: _____

ATTACHMENT 15

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Regional Office
13901 Crown Court **Woodbridge, VA 22193** **(703) 583-3800**

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Town of Culpeper Wastewater Treatment Plant (VA0061590)
REVIEWER: Douglas Frasier
DATE: 14 January 2015

PREVIOUS REVIEW: 5 March 2014

DATA REVIEWED:

This review covers the second (2^{nd}) annual chronic toxicity tests conducted in September 2014 at Outfall 001.

DISCUSSION:

The results of this chronic toxicity test are summarized in Table 1, along with the results of previous toxicity tests performed on effluent samples collected from Outfall 001.

This facility, previous to the 2010 reissuance, had a WET limit of 1.8 TU_c. Staff reevaluated the data and it was determined that a maximum WET limit of 1.5 TU_c should be applied to Outfall 001.

The chronic toxicity test was determined by a 3-brood survival and reproduction chronic test using *Ceriodaphnia dubia* as the test species and consisted of a 24-hour flow proportional composite of the final effluent.

Statistical analyses of the test results yielded a No Observed Effect Concentration (NOEC) of 100% effluent, equal to a TU_c of 1; meeting the WET limit of 1.5 TU_c maximum as specified in the permit.

CONLCUSION:

The chronic toxicity tests are valid and the results are acceptable. The effluent samples from this facility exhibit no chronic toxicity to the test species.

BIOMONITORING RESULTS
Town of Culpeper Wastewater Plant (VA0061590)

Table 1
Summary of WET Limit Testing Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	NOEC (%)	WET (TU_C)	% SURV	48-h LC_{50} (%)	IC_{25} (%)	LAB	REMARKS
03/26/96	Chronic *C. dubia*	100 SR	1.0	100			CBI	
06/25/96	Chronic *C. dubia*	100 SR	1.0	100			CBI	
09/12/96	Chronic *C. dubia*	100 SR	1.0	80			CBI	
12/03/96	Chronic *C. dubia*	**25 R**	**4.0**	100			CBI	
02/25/97	Chronic *C. dubia*	**25 R**	**4.0**	100			CBI	
04/22/97	Chronic *C. dubia*	100SR	1.0	100			CBI	
05/29/97	Chronic *C. dubia*	100SR	1.0	100			CBI	
04/22/97	Chronic *C. dubia*	100 SR	1.0	100			EA	special study
06/24/97	Chronic *C. dubia*	100 SR	1.0	100			CBI	
09/09/97	Chronic *C. dubia*	**50 SR**	**2.0**	100			CBI	
12/16/97	Chronic *C. dubia*	100 SR	1.0	100			CBI	
03/26/98	Chronic *C. dubia*	**25 SR**	**4.0**	0			CBI	
6/09/98	Chronic *C. dubia*	**25 SR**	**4.0**	30			CBI	
8/19/98	Chronic *C. dubia*	**INV**	**INV**				CBI	
10/26/98	Chronic *C. dubia*	100 SR	1.0	90			CBI	
12/15/98	Chronic *C. dubia*	**12.5 SR**	**8.0**	0			CBI	
1/12/99	Chronic *C. dubia*	100 SR	1.0	100			CBI	Retest
3/9/99	Chronic *C. dubia*	100 SR	1.0	100			CBI	
WET = 1.8 TUc maximum Effective April 23, 1999								
4/20/99	Chronic *C. dubia*	100 SR	1.0	100			CBI	
8/17/99	Chronic *C. dubia*	100 SR	1.0	90			CBI	
11/16/99	Chronic *C. dubia*	100 SR	1.0	100			CBI	
2/29/00	Chronic *C. dubia*	55 SR	1.8	90			CBI	
5/9/00	Chronic *C. dubia*	100 SR	1.0	100			CBI	
9/26/00	Chronic *C. dubia*	100 SR	1.0	100			CBI	
11/14/00	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
2/27/01	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	
5/24/01	Acute *C. dubia*			100	>100		CBI	
5/22/01	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
9/11/01	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	

TEST DATE	TEST TYPE/ORGANISM	NOEC (%)	WET (TU_c)	% SURV	48-h LC_{50} (%)	IC_{25} (%)	LAB	REMARKS
12/04/01	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
2/26/02	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
5/14/02	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	3 broods in 5 days
9/24/02	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
12/03/02	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
3/18/03	Chronic *C. dubia*	100 S **13.75 R**	**7.3**	100	>100	21.1	CBI	
5/13/03	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	
12/16/03	Chronic *C. dubia*	100 S **13.75 R**	**7.3**	80	>100	15.1	CBI	
03/02/04	Chronic *C. dubia*	100 S **27.5 R**	**3.6**	90	>100	23.4	CBI	
06/22/04	Chronic *C. dubia*	100 S 55 R	1.8	100	>100	84.1	CBI	
08/24/04	Chronic *C. dubia*	100 S 55 R	1.8	70	>100	65.8	CBI	
Permit Reissued October 1, 2004								
11/02/04	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	1st Quarterly
04/07/05	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	2nd Quarterly NH_3=6.4 mg/L
06/07/05	Chronic *C. dubia*	100 SR	1.0	80	>100	>100	CBI	3rd Quarterly NH_3=5.3 mg/L
08/09/05	Chronic *C. dubia*	100 S 55 R	1.8	80	>100	88.3	CBI	4th Quarterly NH_3<1.0mg/L
11/15/05	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	5th Quarterly
2/7/06	Chronic *C. dubia*	56 R	1.79	100	>100	>100	CBI	6th Quarterly
5/9/06	Chronic *C. dubia*	100 S 56 R	1.79	100	>100	>100	CBI	7th Quarterly
8/1/06	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	8th Quarterly
11/07/06	Chronic *C. dubia*	100 S 56 R	1.79	100	>100	97.7	CBI	9th Quarterly
2/27/07	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	10th Quarterly
6/13/07	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	11th Quarterly
8/24/07	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	12th Quarterly

TEST DATE	TEST TYPE/ORGANISM	NOEC (%)	WET (TU_c)	% SURV	48-h LC_{50} (%)	IC_{25} (%)	LAB	REMARKS
11/15/07	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	13th Quarterly
03/11/08	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	14th Quarterly
06/20/08	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	15th Quarterly
08/12/08	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	16th Quarterly
10/14/08	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	17th Quarterly
03/17/09	Chronic *C. dubia*	100 S 56 R	1.79	100	>100	78.1	CBI	18th Quarterly
06/09/09	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	19th Quarterly
09/01/09	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	20th Quarterly
12/01/09	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	21st Quarterly
03/02/10	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	22nd Quarterly
Permit Reissued 10 March 2010 (CTO issued for 6.0 MGD facility 22 April 2010)								
06/15/10	Chronic *C. dubia*	100 SR	1.0	90	>100	>100	CBI	1st Quarterly
12/14/10	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	2nd Quarterly
03/15/11	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	3rd Quarterly
06/07/11	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	4th Quarterly
09/27/11	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	5th Quarterly
12/13/11	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	6th Quarterly
03/13/12	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	7th Quarterly
07/24/12	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	8th Quarterly
07/16/13	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	1st Annual
09/09/14	Chronic *C. dubia*	100 SR	1.0	100	>100	>100	CBI	2nd Annual

FOOTNOTES:

A **bold** faced LC_{50} or NOEC value indicates that the test failed the criteria.
LC50 based on observations at the end of 48 hours.

ABBREVIATIONS:

S – Survival; G – Growth; R – Reproduction
% SURV – Percent survival in 100% effluent
INV – Invalid
CBI – Coastal Bioanalysts Incorporated
EA – EA Engineering, Science, and Technology, Incorporated

Client: Town of Culpeper
Project ID: CULP1401
Client Sample ID: WWTP Outfall 001
Permit No: VA0061590
Sample Period: 9/8/14 to 9/11/14

Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. John Morgan Town of Culpeper 400 South Main Street Culpeper, VA 22701	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	100	>100	>100	26	**1.00**	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.
For each test method record the highest endpoint T.U.c value (bold) on the DMR.

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures

Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	500	25.7	125	12	301	N/A	Yes
(9/2/14-9/8/14)	CC	99	500	26.5	250	20	339	265-412	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

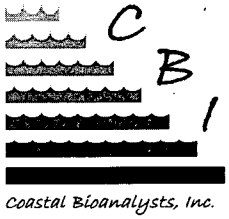
APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

9/18/14
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

VELAP# 460030
EPA# VA01116



GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac}$ = 100/LC50. $T.U._{Chr}$ = 100/NOEC or 100/IC25. A dimensionless unit.

VELAP# 460030
EPA# VA01116

Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	✓	Illumination & photoperiod:	50-100 ft-c 16L:8D	
	Other:		Number of replicates/treatment:	10	
Test solution volume:	15 ml:	✓	Initial number animals/replicate:	1	
	Other (ml):		Template #:	10	

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

SPECIES:	Ceriodaphnia dubia
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater
FEEDING (Culture &Test):	YCT + Selenastrum capricornutum mix
SOURCE:	CBI Stock cultures
ACCLIMATION TEMP (o C):	25
BROOD RELEASE FROM:	9/8/14 12:35
BROOD RELEASE TO:	9/8/14 17:20
DATE/TIME WATER ADDED:	9/9/14 12:15
DATE/TIME ANIMALS ADDED:	9/9/14 12:30
ANIMAL AGE WINDOW (TAC 8 h):	4h 45m
MAX AGE AT TEST START (TAC 24 h):	23h 55m
TEST SET UP BY:	AG
TEST ID:	**CULP1401CCD**
PEER REVIEW BY (Initial/Date):	**AG. PB** 9/15/14 12:06
CULP1401CCD	

Ceriodaphnia daily water quality bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

		Day 0	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	SUMMARY WATER QUALITY DATA			
	TRTMNT	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.73	8.07	7.79	8.12	7.82	8.20	7.74	8.03	7.66	8.16	7.68	8.19			7.93	0.21	7.66	8.20
	1	7.61	8.20	7.75	8.12	7.76	8.20	7.70	8.03	7.70	8.16	7.72	8.06			7.92	0.23	7.61	8.20
	2	7.56	8.20	7.75	8.12	7.77	8.26	7.69	8.00	7.70	8.18	7.73	8.17			7.93	0.25	7.56	8.26
	3	7.53	8.17	7.75	8.15	7.74	8.25	7.68	8.07	7.71	8.15	7.75	8.14			7.92	0.25	7.53	8.25
	4	7.50	8.23	7.73	8.17	7.73	8.23	7.68	8.04	7.71	8.15	7.78	8.14			7.92	0.26	7.50	8.23
	5	7.48	8.20	7.73	8.24	7.72	8.22	7.66	8.05	7.72	8.18	7.79	8.14			7.93	0.27	7.48	8.24
Temp. (o C)	C	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	1	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	2	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	3	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	4	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
	5	25	25	25	25	25	25	25	25	25	25	25	25			25	0.0	25	25
Diss. Oxygen (mg/l)	C	8.1	8.5	8.0	8.5	8.2	8.5	8.2	8.1	8.0	8.5	7.9	8.6			8.3	0.2	7.9	8.6
	1	8.1	8.5	8.0	8.5	8.2	8.6	8.2	8.3	8.0	8.4	7.9	8.6			8.3	0.2	7.9	8.6
	2	8.1	8.7	8.0	8.5	8.2	8.6	8.2	8.3	8.0	8.4	7.8	8.3			8.3	0.3	7.8	8.7
	3	8.1	8.8	8.0	8.5	8.2	8.9	8.2	8.3	8.0	8.4	7.9	8.3			8.3	0.3	7.9	8.9
	4	8.1	8.8	8.0	8.6	8.2	8.4	8.2	8.4	8.0	8.5	7.9	8.3			8.3	0.3	7.9	8.8
	5	8.1	8.9	8.1	8.6	8.2	8.7	8.2	8.4	8.0	8.5	7.9	8.3			8.3	0.3	7.9	8.9
Cond. (uS/cm)	C	299		296		295		305		300		298				299	3.5	295	305
	1	391		384		380		386		386		388				386	3.7	380	391
	2	412		402		402		404		405		410				406	4.2	402	412
	3	436		423		421		428		430		433				429	5.8	421	436
	4	466		448		456		451		455		458				456	6.2	448	466
	5	501		485		486		483		486		483				487	6.8	483	501
Replicate measured		S	D	S	C	S	I	S	G	S	A	S	E			NOTE: Final D.O. Values >8.3 mg/l (saturation) may occur due to photosynthetic activity of algal food.			
Initials		AG	RCD		PB		BJA		RCD		KK		AG						
Changes & Notes (Initials, date, specific change or notes)																			

												TRT ID:	1	2	3	4	5		
CULP1401CCD												CONC:	45.0%	55.0%	67.0%	82.0%	100%		

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO
	A	0	0	0	0	0	0	1			1
C	B	0	0	0	3	8	0	14			25
	C	0	0	0	3	8	0	14			25
Lab	D	0	0	0	6	10	0	14			30
Control	E	0	0	0	6	6	0	14			26
	F	0	0	0	5	8	0	18			31
	G	0	0	0	5	16	0	16			37
	H	0	0	0	4	2	0	14			20
	I	0	0	0	5	12	0	16			33
	J	0	0	0	4	12	0	14			30
	A	0	0	0	4	10	0	12			26
#1	B	0	0	0	5	12	0	18			35
	C	0	0	0	5	12	0	14			31
45.0%	D	0	0	0	5	8	0	12			25
	E	0	0	0	6	12	0	16			34
Vol. Effl:	F	0	0	0	6	14	0	16			36
90 ml	G	0	0	0	5	14	0	14			33
	H	0	0	0	4	6	0	14			24
	I	0	0	0	5	0	10	18			33
	J	0	0	0	6	12	0	14			32
	A	0	0	0	6	10	0	18			34
# 2	B	0	0	0	4	12	0	18			34
	C	0	0	0	5	10	0	16			31
55.0%	D	0	0	0	4	8	0	10			22
	E	0	0	0	2	0	4	14			20
Vol. Effl:	F	0	0	0	6	12	0	16			34
110 ml	G	0	0	0	4	12	0	10			26
	H	0	0	0	6	8	0	18			32
	I	0	0	0	0	0	4	0			4
	J	0	0	0	6	16	0	14			36
	A	0	0	0	5	12	0	16			33
# 3	B	0	0	0	5	12	0	16			33
	C	0	0	0	5	12	0	18			35
67.0%	D	0	0	0	5	12	0	16			33
	E	0	0	0	5	12	0	14			31
Vol. Effl:	F	0	0	0	5	12	0	16			33
134 ml	G	0	0	0	4	8	0	10			22
	H	0	0	0	5	8	0	16			29
	I	0	0	0	4	0	12	18			34
	J	0	0	0	4	10	0	14			28
	A	0	0	0	4	12	16	0			32
# 4	B	0	0	0	6	12	0	16			34
	C	0	0	0	4	10	0	10			24
82.0%	D	0	0	0	5	14	0	14			33
	E	0	0	0	5	12	0	12			29
Vol. Effl:	F	0	0	0	5	10	0	14			29
164 ml	G	0	0	0	6	10	0	14			30
	H	0	0	0	5	12	0	18			35
	I	0	0	0	6	0	12	18			36
	J	0	0	0	3	12	0	12			27
	A	0	0	0	4	10	0	14			28
# 5	B	0	0	0	6	12	0	14			32
	C	0	0	0	5	12	0	12			29
100%	D	0	0	0	5	14	0	18			37
	E	0	0	0	4	12	0	10			26
Vol. Effl:	F	0	0	0	4	12	0	14			30
200 ml	G	0	0	0	4	14	0	18			36
	H	0	0	0	6	14	0	18			38
	I	0	0	0	4	12	0	12			28
	J	0	0	0	5	12	0	12			29
INITIALS:		AG	RCD	PB	BJA	RCD	KK	AG			
DATE & TIME:		9/9/14 12:30	9/10/14 11:54	9/11/14 14:11	9/12/14 14:24	9/13/14 13:31	9/14/14 14:24	9/15/14 12:02			
SAMPLE USED:		A	B	B	C	C	C				
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE											
CULP1401CCD		Avg. young/surviving control (TAC 15 min):			25.8	Surv. controls with 3 broods:		9			

SAMPLE COLLECTION

SAMPLE	COLLECTION DATE & TIME
A	9/8/14 11:37
B	9/9/14 12:05
C	9/11/14 11:06
D	
E	

SAMPLE AGING

SAMPLE:	A
1st USE DATE/TIME:	9/9/14 12:30
LAST USE DATE/TIME:	9/9/14 12:30
TIME COLLECT TO 1st USE:	24h 53m
	(TAC 36 h max)
TIME 1st TO LAST USE:	0h 0m
	(TAC MAX 72 h)
SAMPLE:	B
1st USE DATE/TIME:	9/10/14 11:54
LAST USE DATE/TIME:	9/11/14 14:11
TIME COLLECT TO 1st USE:	23h 50m
	(TAC 36 h max)
TIME 1st TO LAST USE:	26h 17m
	(TAC MAX 72 h)
SAMPLE:	C
1st USE DATE/TIME:	9/12/14 14:24
LAST USE DATE/TIME:	9/14/14 14:24
TIME COLLECT TO 1st USE:	27h 19m
	(TAC 36 h max)
TIME 1st TO LAST USE:	48h 0m
	(TAC MAX 72 h)
SAMPLE:	D
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)
SAMPLE:	E
1st USE DATE/TIME:	
LAST USE DATE/TIME:	
TIME COLLECT TO 1st USE:	0
	(TAC 36 h max)
TIME 1st TO LAST USE:	0
	(TAC MAX 72 h)

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/ SURV FEM
	A	1	1	1	1	1	1	1	1	F	1	1
C	B	1	1	1	1	1	1	1	1	F	25	25
	C	1	1	1	1	1	1	1	1	F	25	25
Lab	D	1	1	1	1	1	1	1	1	F	30	30
Control	E	1	1	1	1	1	1	1	1	F	26	26
	F	1	1	1	1	1	1	1	1	F	31	31
	G	1	1	1	1	1	1	1	1	F	37	37
	H	1	1	1	1	1	1	1	1	F	20	20
	I	1	1	1	1	1	1	1	1	F	33	33
	J	1	1	1	1	1	1	1	1	F	30	30
	A	1	1	1	1	1	1	1	1	F	26	
#1	B	1	1	1	1	1	1	1	1	F	35	
	C	1	1	1	1	1	1	1	1	F	31	
45.0%	D	1	1	1	1	1	1	1	1	F	25	
	E	1	1	1	1	1	1	1	1	F	34	
	F	1	1	1	1	1	1	1	1	F	36	
	G	1	1	1	1	1	1	1	1	F	33	
	H	1	1	1	1	1	1	1	1	F	24	
	I	1	1	1	1	1	1	1	1	F	33	
	J	1	1	1	1	1	1	1	1	F	32	
	A	1	1	1	1	1	1	1	1	F	34	
# 2	B	1	1	1	1	1	1	1	1	F	34	
	C	1	1	1	1	1	1	1	1	F	31	
55.0%	D	1	1	1	1	1	1	1	1	F	22	
	E	1	1	1	1	1	1	1	1	F	20	
	F	1	1	1	1	1	1	1	1	F	34	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	32	
	I	1	1	1	1	1	1	1	1	F	4	
	J	1	1	1	1	1	1	1	1	F	36	
	A	1	1	1	1	1	1	1	1	F	33	
# 3	B	1	1	1	1	1	1	1	1	F	33	
	C	1	1	1	1	1	1	1	1	F	35	
67.0%	D	1	1	1	1	1	1	1	1	F	33	
	E	1	1	1	1	1	1	1	1	F	31	
	F	1	1	1	1	1	1	1	1	F	33	
	G	1	1	1	1	1	1	1	1	F	22	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	34	
	J	1	1	1	1	1	1	1	1	F	28	
	A	1	1	1	1	1	1	1	1	F	32	
# 4	B	1	1	1	1	1	1	1	1	F	34	
	C	1	1	1	1	1	1	1	1	F	24	
82.0%	D	1	1	1	1	1	1	1	1	F	33	
	E	1	1	1	1	1	1	1	1	F	29	
	F	1	1	1	1	1	1	1	1	F	29	
	G	1	1	1	1	1	1	1	1	F	30	
	H	1	1	1	1	1	1	1	1	F	35	
	I	1	1	1	1	1	1	1	1	F	36	
	J	1	1	1	1	1	1	1	1	F	27	
	A	1	1	1	1	1	1	1	1	F	28	
# 5	B	1	1	1	1	1	1	1	1	F	32	
	C	1	1	1	1	1	1	1	1	F	29	
100%	D	1	1	1	1	1	1	1	1	F	37	
	E	1	1	1	1	1	1	1	1	F	26	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	36	
	H	1	1	1	1	1	1	1	1	F	38	
	I	1	1	1	1	1	1	1	1	F	28	
	J	1	1	1	1	1	1	1	1	F	29	

See Reproduction Sheet for Renewal Information

See ToxCalc printout for summary survival & reproduction data

CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE	

CULP1401CCD	% Control survival (TAC 80% min):	100	% Surviving controls with 3 broods (TAC 60% min):	90

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: Test ID: CULP1401 Sample ID:
End Date: Lab ID: CBI Sample Type:
Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.000	25.000	25.000	30.000	26.000	31.000	37.000	20.000	33.000	30.000
45	26.000	35.000	31.000	25.000	34.000	36.000	33.000	24.000	33.000	32.000
55	34.000	34.000	31.000	22.000	20.000	34.000	26.000	32.000	4.000	36.000
67	33.000	33.000	35.000	33.000	31.000	33.000	22.000	29.000	34.000	28.000
82	32.000	34.000	24.000	33.000	29.000	29.000	30.000	35.000	36.000	27.000
100	28.000	32.000	29.000	37.000	26.000	30.000	36.000	38.000	28.000	29.000

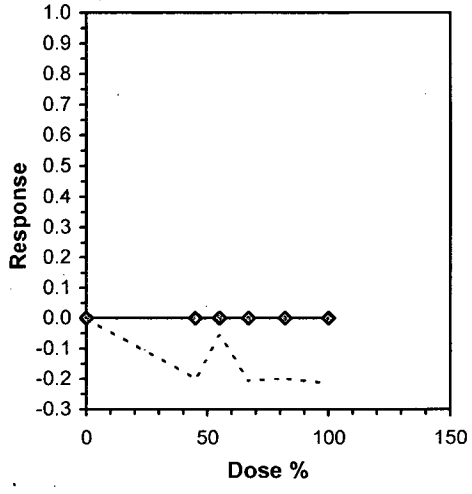
			Transform: Untransformed					Rank	1-Tailed	Isotonic	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
CONTROL	25.800	1.0000	25.800	1.000	37.000	38.535	10			29.550	1.0000
45	30.900	1.1977	30.900	24.000	36.000	14.020	10	124.00	75.00	29.550	1.0000
55	27.300	1.0581	27.300	4.000	36.000	36.058	10	115.50	75.00	29.550	1.0000
67	31.100	1.2054	31.100	22.000	35.000	12.449	10	126.50	75.00	29.550	1.0000
82	30.900	1.1977	30.900	24.000	36.000	12.247	10	121.50	75.00	29.550	1.0000
100	31.300	1.2132	31.300	26.000	38.000	13.559	10	122.00	75.00	29.550	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)	0.84698	1.035	-1.789	5.43603
Bartlett's Test indicates unequal variances (p = 1.36E-03)	19.8104	15.0863		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	(100)	>100		1

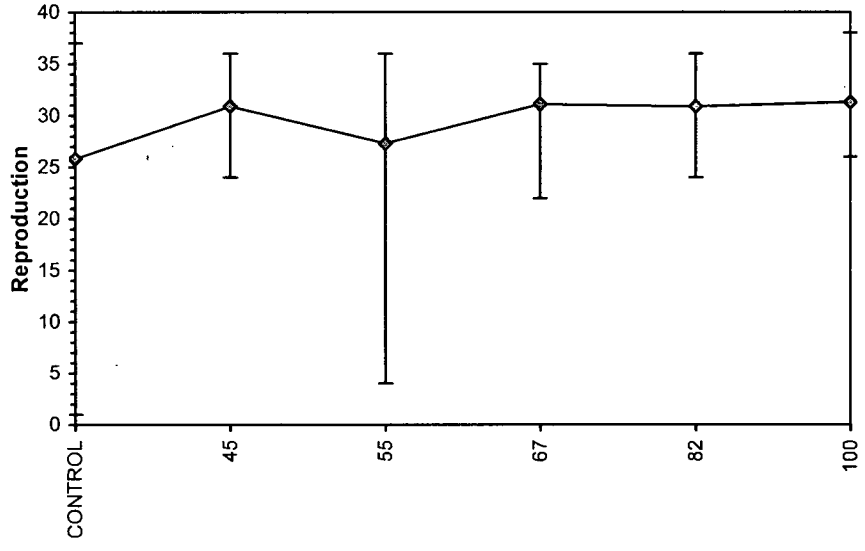
Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	(>100)			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction				
Start Date:	Test ID:	CULP1401	Sample ID:	
End Date:	Lab ID:	CBI	Sample Type:	
Sample Date:	Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB			

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	Test ID: CULP1401	Sample ID:	
End Date:	Lab ID: CBI	Sample Type:	
Sample Date:	Protocol: EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:	DATA ENTERED BY PB		

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	1.000	25.000	25.000	30.000	26.000	31.000	37.000	20.000	33.000	30.000
45	26.000	35.000	31.000	25.000	34.000	36.000	33.000	24.000	33.000	32.000
55	34.000	34.000	31.000	22.000	20.000	34.000	26.000	32.000	4.000	36.000
67	33.000	33.000	35.000	33.000	31.000	33.000	22.000	29.000	34.000	28.000
82	32.000	34.000	24.000	33.000	29.000	29.000	30.000	35.000	36.000	27.000
100	28.000	32.000	29.000	37.000	26.000	30.000	36.000	38.000	28.000	29.000

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
CONTROL	25.800	1.0000	25.800	1.000	37.000	38.535	10			
45	30.900	1.1977	30.900	24.000	36.000	14.020	10	-1.726	2.287	6.755
55	27.300	1.0581	27.300	4.000	36.000	36.058	10	-0.508	2.287	6.755
67	31.100	1.2054	31.100	22.000	35.000	12.449	10	-1.794	2.287	6.755
82	30.900	1.1977	30.900	24.000	36.000	12.247	10	-1.726	2.287	6.755
100	31.300	1.2132	31.300	26.000	38.000	13.559	10	-1.862	2.287	6.755

Auxiliary Tests					Statistic		Critical		Skew	Kurt
Kolmogorov D Test indicates normal distribution (p > 0.01)					0.84698		1.035		-1.789	5.43603
Bartlett's Test indicates unequal variances (p = 1.36E-03)					19.8104		15.0863			
Hypothesis Test (1-tail, 0.05)	**NOEC**	**LOEC**	**ChV**	**TU**	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test	100	>100		1	6.75546	0.26184	56.47	43.6389	0.28016	5, 54

Dunnett's test for PMSD

Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

											SUMMARY WATER QUALITY DATA				
Initial sample characterization	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER
	Arrival Temp. (oC, from CoC):	1	1	1							1	0.0	1	1	Arrival Temp.
	TRC (mg/l)(2):	<DL	<DL	<DL											
	TRC Corrected(2):														
	Hardness (mg/l):	116	94	78							96	19.1	78	116	Hardness (mg/l)
	Alkalinity (mg/l):	65	71	73							70	4.2	65	73	Alkalinity (mg/l)
	NH3-N (mg/l):	<1.0	<1.0	<1.0											
	Color/Appearance(3):	C	C	C											
	Obvious odor?	NO	NO	NO											
	Date & Time:	9/9/14 9:57	9/10/14 10:08	9/12/14 10:15											
	Initials:	GB	GB	GB											
Sample prep measure-ments	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Bottle(s):	A1	B1	B1	C1	C1	C1								
	Prep. Temp. (oC):	26	25	25	25	25	25				25	0.4	25	26	Temp. (oC)
	D.O. (mg/l) After Warming:	8.1	8.4	9.1	8.2	8.8	8.9								
	Aeration Time (min):	0	1	2	0	1	1								
	Adjusted D.O. (mg/l):	8.1	8.2	8.2	8.2	8.1	8.1				8.2	0.1	8.1	8.2	D.O. (mg/l)
	Final pH (S.U.):	7.53	7.78	7.77	7.71	7.74	7.81				7.72	0.10	7.53	7.81	pH (S.U.)
	Conductivity (uS/cm)(4):	501	498	NA	488	NA	NA				496	6.8	488	501	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.								
	Sample Filtered (60 um)?	☑	☑	☑	☑	☑	☑	☐	☐	☐					
	Date & Time:	9/9/14 11:39	9/10/14 11:27	9/11/14 13:35	9/12/14 13:37	9/13/14 13:05	9/14/14 13:51								
	Initials:	AG	RCD	PB	BJA	RCD	KK								
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7		MEAN	S.D.	MIN.	MAX.	
	Vat Number:	3	1	1	2	3	3								
	Temperature (oC):	25	25	25	25	25	25				25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	302	299	297	295	303	297				299	3.1	295	303	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2				8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.83	7.87	7.88	7.84	7.86	7.81				7.85	0.03	7.81	7.88	pH (S.U.)
	Hardness (mg/l):	98	98	98	100	98	98				98	0.8	98	100	Hardness (mg/l)
	Alkalinity (mg/l):	58	62	62	63	59	59				61	2.1	58	63	Alkalinity (mg/l)
	Date & Time:	9/9/14 8:30	9/10/14 8:40	9/11/14 8:20	9/12/14 8:20	9/13/14 8:20	9/14/14 8:20								
	Initials:	GB	GB	PB	GB	RCD	RCD								
	Changes & Notes (Initials, date, specific change or notes)														

Peer review Initial/Date:	AG. PB	9/15/14 12:07	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)
PROJECT ID:	CULP1401	ADDITIONAL EFFLUENT TREATMENT:		

ND=Not Determined/Measured, NA=Not Applicable 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l, QL 0.22 mg/l. Corrected value if Mn, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (Sl-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): C U L P 1 4 0 1 - A
A A A A Y Y N N (Project ID) | A (Spl)

CBI Login # 14-0724

FACILITY INFORMATION

CLIENT/FACILITY NAME: Town of Culpeper WWTP		CONTACT & PHONE #: Jim Hust 540-825-1195	
NPDES PERMIT NO: VA 61590			OUTFALL # OR LOCATION: 001
SAMPLE CHLORINATED? No	SAMPLE DECHLORINATED? No	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	
TESTS REQUESTED:	SPECIES OR EPA METH #: C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☐
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME: 9/7/14 11:36	SAMPLE END DATE & TIME: 9/8/14 11:37	AUTOSAMPLER TEMP. (°C): 4°C Iced Sample	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION: NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES	TIME INCREMENT	
SET VOLUME SUBSAMPLE: 150 ml	SET VOLUME FLOW: 1389 gpm	TOTAL VOLUME: 2MGD	Sample total 14,400 ml

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
23.5°C	7.3	4°C	7.7	ND	9/8/14 11:59	JPH

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

fo James P. Hust Chief Operator (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) | James P. Hust (SIGNATURE) | 9/8/14 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
	9/9/14	0950	

SHIPPING METHOD: UPS ✓ FEDEX ____ HAND DELIVERY ____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

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www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): C U L P 1 4 D 1 - B
A A A A Y Y N N (Project ID) | A (Spl)

CBI Login # 14-0240

FACILITY INFORMATION

CLIENT/FACILITY NAME: Town of Culpeper		CONTACT & PHONE #: Jim Hust 540-825-1199	
NPDES PERMIT NO: VA 61590			OUTFALL # OR LOCATION
SAMPLE CHLORINATED? No	SAMPLE DECHLORINATED? No	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?	
TESTS REQUESTED:	SPECIES OR EPA METH #: C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☐
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME: 9/8/14 12:05		SAMPLE END DATE & TIME: 9/9/14 12:05		AUTOSAMPLER TEMP. (°C): Iced Sampler	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES		TIME INCREMENT	
	SET VOLUME SUBSAMPLE: 150ml	SET VOLUME FLOW: 1528 gpm		TOTAL VOLUME: 2.2 MGD	4,400ml

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
23.7	7.4	4°C	7.7	ND	9/9/14 12:10	JPH

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

James Hust Chief Operator — James Hust — 9/9/14
(PRINTED NAME/AFFILIATION SAMPLER/ANALYST) (SIGNATURE) (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
	9/10/14	0955	

SHIPPING METHOD: UPS ✓ FEDEX ____ HAND DELIVERY ____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ____

SAMPLE TEMP: (°C) ____ ARRIVED ON ICE? Y ✓ N ____ CUSTODY SEAL: INTACT ____ BROKEN ____ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Coastal Bioanalysts
6400 Enterprise Court, Gloucester, VA 23061
PH: 804-694-8285, FAX: 804-695-1129
www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID (Lab Use Only): C U L P 1 4 0 1 - C
A A A A Y Y N N (Project ID) — A (Spl)

CBI Login # 14-0258

FACILITY INFORMATION

CLIENT/FACILITY NAME	Town of Culpeper	CONTACT & PHONE #	Jim Hust 540-825-1159
NPDES PERMIT NO	VA 61590	OUTFALL # OR LOCATION	001
SAMPLE CHLORINATED?	No	SAMPLE DECHLORINATED? No	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES?
TESTS REQUESTED:	SPECIES OR EPA METH # C. dubia	ACUTE ☐	CHRONIC ☑
	SPECIES OR EPA METH #	ACUTE ☐	CHRONIC ☐
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	SAMPLE TIME	SAMPLE VOLUME

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	9/10/14 10:05	SAMPLE END DATE & TIME	9/11/14 11:06	AUTOSAMPLER TEMP. (°C)	Iced Sampler
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES		TIME INCREMENT	
	SET VOLUME SUBSAMPLE 150ml	SET VOLUME FLOW 1528 gpm		TOTAL VOLUME 22 MGD	14,400mls

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS
23.7	7.5	4°C	7.6	ND	9/11/14 11:10	JPH

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

James P. Hust (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) — James P. Hust (SIGNATURE) — 9/11/14 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
	9/12/14	0955	D. Bir

SHIPPING METHOD: UPS ✓ FEDEX ____ HAND DELIVERY ____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON

CONDITION ON ARRIVAL: ACCEPTABLE ✓ OTHER ____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y ✓ N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT ✓

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

4/30/2015 2:05:19 PM

Facility = Town of Culpeper WWTP
Chemical = Chronic C. dubia
Chronic averaging period = 4
WLAa = 3.035
WLAc = 1.017
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 10
Expected Value = 1
Variance = 0
C.V. = 0
97th percentile daily values = 1
97th percentile 4 day average = 1
97th percentile 30 day average= 1
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

1
1
1
1
1
1
1
1
1
1

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 12/13/13
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:	04/30/15
Facility Name:	Town of Culpeper WWTP
VPDES Number:	VA0061950
Outfall Number:	1
Plant Flow:	6 MGD
Acute 1Q10:	0.07 MGD
Chronic 7Q10:	0.1 MGD

Acute Endpoint/Permit Limit			**Use as LC_{50} in Special Condition, as TUa on DMR**				
ACUTE	100% =	NOAEC	LC_{50} =	NA	% Use as	NA	TUa
ACUTE WLAa		0.3035	Note: Inform the permittee that if the mean of the data exceeds				
			this TUa:	1.0	a limit may result using STATS.EXE		

Chronic Endpoint/Permit Limit			**Use as NOEC in Special Condition, as TUc on DMR**				
CHRONIC	1.48695093	TU_c	NOEC =	68	% Use as	1.47	TU_c
BOTH*	3.03500007	TU_c	NOEC =	33	% Use as	3.03	TU_c
AML	1.48695093	TU_c	NOEC =	68	% Use as	1.47	TU_c

ACUTE WLAa,c	3.035	Note: Inform the permittee that if the mean	
CHRONIC WLAc	1.01666667	of the data exceeds this TUc:	1.0
* Both means acute expressed as chronic		a limit may result using STATS.EXE	

% Flow to be used from MIX.EXE

Diffuser /modeling study?

Enter Y/N	n	
Acute	1	:1
Chronic	1	:1

Are data available to calculate CV? (Y/N)	N	(Minimum of 10 data points, same species, needed)	Go to Page 2
Are data available to calculate ACR? (Y/N)	N	(NOEC<LC50, do not use greater/less than data)	Go to Page 3

IWC_a	98.84678748 %	Plant flow/plant flow + 1Q10	**NOTE: If the IWCa is >33%, specify the**
IWC_c	98.36065574 %	Plant flow/plant flow + 7Q10	**NOAEC = 100% test/endpoint for use**

Dilution, acute	1.011666667	100/IWCa
Dilution, chronic	1.016666667	100/IWCc

WLA_a	0.3035	Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	1.016666667	Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	3.035	ACR X's WLA_a - converts acute WLA to chronic units
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)
Constants eA	0.4109447	Default = 0.41
eB	0.6010373	Default = 0.60
eC	2.4334175	Default = 2.43
eD	2.4334175	Default = 2.43 (1 samp) No. of sample 1

****The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The $LTA_{a,c}$ and MDL using it are driven by the ACR.**

$LTA_{a,c}$	1.247217165	WLAa,c X's eA					
LTA_c	0.611054588	WLAc X's eB				Rounded NOEC's	%
MDL** with $LTA_{a,c}$	3.035000074	TU_c	NOEC =	32.948928	(Protects from acute/chronic toxicity)	NOEC = 33	%
MDL** with LTA_c	1.486950929	TU_c	NOEC =	67.251715	(Protects from chronic toxicity)	NOEC = 68	%
AML with lowest LTA	1.486950929	TU_c	NOEC =	67.251715	Lowest LTA X's eD	NOEC = 68	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

								Rounded LC50's		%
MDL with $LTA_{a,c}$	0.303500007	TU_a	LC50 =	329.489284	%	Use NOAEC=100%	LC50 =	NA		%
MDL with LTA_c	0.148695093	TU_a	LC50 =	672.517149	%	Use NOAEC=100%	LC50 =	NA		

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA

(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB

(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC

(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD

(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate			Invertebrate	
	IC_{25} Data			IC_{25} Data	
	or			or	
	LC_{50} Data	LN of data		LC_{50} Data	LN of data
	**********			**********	
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		
St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA
Mean	0	0	Mean	0	0
Variance	0	0.000000	Variance	0	0.000000
CV	0		CV	0	

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA

ACR for vertebrate data: 0

Table 1. Result: Vertebrate ACR 0

Table 2. Result: Invertebrate ACR 0

Lowest ACR: Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA

ACR for vertebrate data: 0

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring % Effluent	Monitoring TUc	Limit % Effluent	Limit TUc
Dilution series based on data mean	100	1.0		
Dilution series to use for limit			68	1.4705882
Dilution factor to recommend:	0.5		0.8246211	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	50.0	2.00	82.5	1.21
	25.0	4.00	68.0	1.47
	12.5	8.00	56.1	1.78
	6.25	16.00	46.2	2.16
Extra dilutions if needed	3.12	32.05	38.1	2.62
	1.56	64.10	31.4	3.18

Table 3. Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

ACR used: 10

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here: NO DATA $\%LC_{50}$

NO DATA TUa

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

ATTACHMENT 16

TOWN OF CULPEPER

400 S. Main St., Suite 101 • Culpeper, VA 22701
(540) 829-8250 • FAX (540) 829-8249
www.culpeperva.gov

January 9, 2015

Ms. Joan Crowther
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

RE: Town of Culpeper
Annual Inflow and Infiltration (I&I) Report

Dear Ms. Crowder:

During 2014, the Town has slip lined 1227 feet of 14" of sewer pipe and 793 feet of 10" sewer pipe. The Public Works staff is currently repairing Edmundson Street Sewer and Stormwater lines. The combined projects have cost the Town $114,509.50 of its FY15 budget. The Town anticipated the continuation of the slip lining effort through the rest of FY15 with additional spending anticipated to be approximately $35,000. Staff is currently developing the budget for FY16 and anticipated additional manhole rehabilitation and slip lining will be included.

The Town will continue tracking Water Production, Rainfall and Wastewater treated and will seek a downward trend in the I&I. Annual comparisons are difficult to assess due to the differences in rainfall events and the frequency of the rainfall. However, we have noticed a significant reduction in I&I which appears to have started in June 2014. We believe this reduction is attributable to work completed during that time but we will be closely monitoring I&I through 2015 to see if the trend continues.

Due to these recognized trends and identified areas of concern, the Town will continue to pursue the reduction of I&I in the Town's Sewer system for 2015. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Christopher D. Hively, P.E.
Acting Town Manager

Attachment

cc: Jim Hoy, Director of Public Works
Jim Hust, Chief Wastewater Treatment Plant Operator

2013 Water and Wastewater flow comparison in MGD.

	Wastewater flow		Finished Water production			Raw meter-Finished meter		Library of Congress		Unexplained flow or I & I		
MGD	Flows avg/day	Monthly Total	Daily Average	Monthly Total	Raw	avg/day	Total	Average	Total	Daily Average	Monthly Total	Rainfall
Jan-13	2.97	92	1.75	54.18	63.48	0.30	9.3	0.02	0.618	0.90	27.90	4.4
Feb-13	3.23	90.41	1.73	48.37	56.63	0.30	8.26	0.02	0.421	1.19	33.36	1.7
Mar-13	3.88	120.35	1.68	52.07	59.39	0.24	7.32	0.01	0.367	1.95	60.59	3.4
Apr-13	3.08	92.46	1.79	53.7	63.03	0.31	9.33	0.02	0.454	0.97	28.98	1.7
May-13	3.04	94.39	1.85	57.38	66.23	0.29	8.85	0.01	0.421	0.89	27.74	4.4
Jun-13	3.88	116.43	1.87	56.24	65.41	0.31	9.17	0.03	0.975	1.67	50.05	9.6
Jul-13	3.49	108.2	2.08	64.39	73.79	0.30	9.4	0.03	0.896	1.08	33.51	5.5
Aug-13	3.06	94.78	1.88	58.37	67.8	0.30	9.43	0.03	0.875	0.84	26.11	5
Sep-13	2.51	75.17	1.88	56.44	64.48	0.27	8.04	0.02	0.702	0.33	9.99	0.5
Oct-13	2.85	88.48	1.84	57.15	66.9	0.31	9.75	0.02	0.571	0.68	21.01	4.5
Nov-13	2.62	78.73	1.77	53.2	62.48	0.31	9.28	0.01	0.449	0.53	15.80	3.5
Dec-13	3.69	114.3	1.65	51.14	60.03	0.29	8.89	0.01	0.435	1.74	53.84	6.1
AVG/TOTA	3.19	1165.70	1.81	662.63		0.29	107.02	0.02	7.18	1.06	388.87	50.30

2014 Water and Wastewater flow comparison in MGD.

	Wastewater flow		Finished Water production			Raw meter-Finished meter		Library of Congress		Unexplained flow or I & I		
MGD	Flows avg/day	Monthly Total	Daily Average	Monthly Total	Raw	avg/day	Total	Average	Total	Daily Average	Monthly Total	Rainfall
Jan-14	3.47	107.65	1.75	54.25	60.82	0.21	6.57	0.02	0.523	1.49	46.31	3.7
Feb-14	3.88	108.63	1.99	55.69	58.84	0.11	3.15	0.02	0.552	1.76	49.24	4.1
Mar-14	3.53	109.28	1.80	55.69	60.43	0.15	4.74	0.02	0.601	1.56	48.25	4
Apr-14	3.86	115.75	1.83	54.78	58.84	0.14	4.06	0.02	0.6	1.88	56.31	6.7
May-14	4.75	147.33	1.95	60.39	64.49	0.13	4.1	0.02	0.731	2.65	82.11	5.3
Jun-14	3.44	103.3	2.08	62.32	71.67	0.31	9.35	0.03	0.847	1.03	30.78	3.8
Jul-14	2.85	88.21	2.00	62.09	68.53	0.21	6.44	0.03	1.064	0.60	18.62	3.8
Aug-14	2.63	81.43	2.01	62.26	67.46	0.17	5.2	0.03	0.927	0.42	13.04	2.7
Sep-14	2.32	69.47	1.96	58.68	64.62	0.20	5.94	0.03	1.039	0.13	3.81	1.7
Oct-14	2.64	81.98	2.07	64.04	72.88	0.29	8.84	0.02	0.752	0.27	8.35	3.5
Nov-14	2.66	79.87	2.04	61.25	68.85	0.25	7.6	0.02	0.72	0.34	10.30	2.8
Dec-14	3.17	98.34	2.12	65.82	74.4	0.28	8.58	0.03	0.93	0.74	23.01	3.9
AVG/TOTA	3.27	1191.24	1.97	717.26		0.20	74.57	0.03	9.29	1.07	390.12	46.00

ATTACHMENT 17

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Culpeper County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2015 to XXX, 2015

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Town of Culpeper, 400 South Main St, Culpeper, VA 22701 VA0061590

NAME AND ADDRESS OF FACILITY: Town of Culpeper WPCF, 15108 Service Lane, Culpeper, VA 22701

PROJECT DESCRIPTION: The Town of Culpeper has applied for a reissuance of a permit for the public Town of Culpeper WPCF. The applicant proposes to release treated sewage wastewaters from residential and commercial areas at a rate of 6.0 million gallons per day into a water body. The sludge will be disposed by land application by an approved contractor. The facility proposes to release the treated sewage water in Mountain Run in Culpeper County in the Rappahannock watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Ammonia as N, BOD_5, $CBOD_5$, TSS, Total Kjeldahl Nitrogen, *E. coli,* Total Nitrogen, Total Phosphorus, and Dissolved Oxygen. The permittee shall monitor without limitation the following parameters: Nitrate+Nitrite, and Whole Effluent Toxicity.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
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